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THE EMERGENCY TREATMENT OF THE BLADDER IN TRAUMATIC PARAPLEGIA*

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The most important principle which emerges from a study of what has been written on this subject since the second World War is that all paraplegics should be admitted as soon as possible to special centres. It is only thus that these cases will receive the meticulous care and attention and the assiduous re-education which are essential to their well-being. This ideal is as yet far from being realised in the Union.

At one time it was held that early suprapubic cystostomy was the best way of treating paraplegics, a view that I supported in a paper published in 1949.²

Long after Munro's tidal drainage⁶ had become popular, C. C. Prather⁷ wrote an authoritative paper advocating cystostomy, with tidal drainage and frequent cystometry, on all cases but those with partial injuries who might be expected to develop early voluntary micturition. The dangers of long-continued catheter drainage, with epididymitis, urethritis, fistulae due to sloughing at the peno-scrotal angle, and other septic complications, were stressed. Prather held that drainage was likely to be needed for several months and should be maintained by suprapubic cystostomy.

Munro's work was recognized, but the picture was dominated by the need for a fool-proof system of bladder drainage in patients who were being evacuated from the theatre of war.

Munro's work, a development of an automatic bladder irrigation first described in 1917 by Laver, of Guy's Hospital, was very popular in Britain during the early years of the second World War, and I saw a number of paraplegics at the orthopaedic hospital at Stanmore. Many of these cases had been transferred from a neurosurgical centre where tidal drainage through a urethral catheter had been applied.

Most of them were shockingly septic and I succeeded in remedying this state of affairs by performing suprapubic cystostomy.

Later, during the Italian campaign, it was a routine to perform cystostomy on paraplegic soldiers and to evacuate them by air, in a plaster bed.

It was only after the end of the war that I began to realize that properly managed catheter drainage could really be handled aseptically and the enthusiasm of the late Professor M. Cole Rous certainly produced good results at Groote Schuur Hospital, Cape Town, but the Munro apparatus was cumbersome, often went wrong, and was often mismanaged in a general hospital where there was no specialized team to handle it.

Now, under the more static conditions of peace, urethral drainage is universally accepted, and ordinary direct drainage into a bottle, without tidal drainage, is the method generally used. At the Annual Meeting of the Section of Urology of the Royal Society of Medicine in June 1955, none of the speakers advocated suprapubic cystostomy as a primary treatment. It is true that Gibbon³ stated that a cystostomy was compatible with the maintenance for many years of a normal upper urinary tract, and that caution should be used when closure of the suprapubic fistula was contemplated in such a case. It is true also that Band¹ has advocated permanent suprapubic cystostomy with permanent occlusion of the urethra in certain types of paraplegia in females. But as an accepted initial treatment cystostomy is a thing of the past.

Modern concepts of the treatment of the paraplegic have been developed largely as a result of the establishment of special centres where these cases are admitted as soon as possible after the injury and are dealt with by a specialized team consisting of neurosurgeon, orthopaedic surgeon, plastic surgeon and urologist. It is largely as a result of this

* A paper read at the South African Urological Congress, Port Elizabeth, November 1956.

segregation of cases that the mortality has fallen so markedly in recent years.

The mortality in paraplegics is as a rule due to urinary sepsis, to bedsores, or to a combination of these two factors, and treatment must be constant and vigilant from the very outset in order to prevent these complications.

In the early phases of treatment the bladder is an atonic neurogenic bladder. It becomes greatly distended and a paralytic overflow incontinence results. The detrusor is paralysed, the internal sphincter is closed and the external sphincter is relaxed. It is this stage, or the early part of this stage, that I have to discuss.

The questions that arise are legion. How soon should the bladder be emptied? Under what conditions should the catheter first be passed? How should drainage be maintained?

Guttmann,⁴ of Stoke Mandeville, advocates a stage of non-interference lasting 24 hours or even longer according to the rate of secretion of urine. Gentle manual pressure is used and digital massage *per rectum* may help to assist emptying. When the bladder is full the patient is catheterized under conditions of scrupulous theatre-asepsis. At first the catheterization is intermittent. (This has been stringently condemned by most other writers, from Thomson Walker onwards.) Guttmann claims that it is possible to maintain aseptis, that the urethra by this means becomes accustomed in stages to the presence of a foreign body, and that pressure-sores in the urethra are thus avoided. In incomplete lesions this may be enough and voluntary micturition may become established. In most cases after 48 hours of intermittent 8-hourly catheterization a 16 Fr. catheter with a 5-c.c. bulb is passed and left in. At first the catheter is changed daily. Later it is changed every 2 or 3 days. The urethra is washed out at each changing with 1 : 2000 flavazole or local chloromycetin. This stage of treatment is conducted under an umbrella of small doses of sulphatriad and terramycin. Plaster casts and plaster beds are avoided. Pillows and Sorbo packs and regular turning help to prevent bedsores, and early ambulation is aimed at. Operations on the spine are not favoured.

Hardy,⁵ of Sheffield, on the other hand, works at a clinic where orthopaedic operations with exposure of the lesion and spinal fixation are frequent. It is claimed that this operation may free two or three dermatomes from paralysis, leave the permanent disability at a lower level, and facilitate re-education in ambulation. No plaster is used. The patient is nursed on ordinary mattresses on spinal beds. Rolling and turning every 2 hours and special care of the skin prevent bedsores. Mobilization to semi-recumbent and sitting positions is effected in from 8 to 12 weeks.

Hardy uses continuous urethral catheter drainage, a high fluid intake, and intermittent irrigations by hand. The catheter is a 16 or 18 Fr. latex Foley. Great stress is laid upon care of the bowels and upon passive movements to control muscle spasms.

Cosbie Ross⁶ uses an indwelling polythene tube, 1.5 or 2 mm. in internal diameter, with a large lateral drainage hole and a rounded end. He claims that this may be left in for as long as 40 days. It is then replaced by a Foley catheter. This should be small (16 Fr.) and should be changed weekly under theatre conditions. The period of catheter

drainage may last as long as 6 months. Ross claims that the occurrence of periurethral abscess or fistula has been abolished and the incidence of epididymitis greatly reduced.

It is obvious from the above that very meticulous handling by special teams is needed for the care of paraplegics, whatever the special methods used. In the hospitals at which I work, an endeavour is made to carry out the main principles of treatment, but the cases are seen in orthopaedic or general wards and have often already been placed on catheter drainage when the urologist first sees them.

I should like to suggest a scheme for work under these conditions as follows:

1. Allow the bladder to fill before passing a catheter.
2. Call the urological team to perform the first catheterization. I personally am much attracted by Ross' polythene tube. A 'no touch' technique should be used.
3. Maintain a fluid intake of 6-8 pints in the 24 hours.
4. Avoid alkalization of the urine. The urine should, in fact, be kept acid with large doses of acid sodium phosphate. If it is allowed to become alkaline the tubes or catheters rapidly become blocked with phosphates.
5. Give suitable small doses of sulphonamides or antibiotics. If sulphonamides are used it is important to avoid those whose acetyl derivatives can cause crystallization or inspissation in the urinary tract. Gantrisin, Elkosin, and the various triple sulphonamides are fairly free from these dangers.
6. Maintain ordinary straight drainage into a bottle which contains a layer of antiseptic at the bottom.
7. Fix the tube into which the catheter fits to the *front* of the thigh and not to the bed. A catheter passing behind the thigh may be angulated and may cause urethral pressure and necrosis, or may block. A tube fixed to the bed may be pulled out. There should be a comfortable loop between the meatus and the point of fixation to the thigh.
8. I like to wrap the end of the penis in a piece of gauze soaked in 1 : 1000 flavine in oil, and to maintain it in position by very lightly tied pieces of gauze.

In conclusion, I should like to emphasize once again the importance of establishing special centres for these unfortunate victims. In this country there are certain administrative difficulties in catering for all paraplegics together, since treatment is under the authority of the Hospitals Departments of the Provinces, whereas rehabilitation is the concern of the Department of Social Welfare. As treatment and rehabilitation should go hand-in-hand in paraplegics, it is essential to devise some administrative formula which solves this problem, establishes paraplegic centres wherever needed, and permits special teams to get on with a unified job.

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RICKE

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EDITORIAL

RICKETS, OSTEOMALACIA AND THE RENAL TUBULES

The primary action of vitamin D is on the small intestine, where it facilitates the absorption of calcium and, secondarily, of phosphorus. In simple vitamin-D-lack rickets, the serum phosphorus is always low, while the serum calcium is sometimes low (with tetany) and sometimes within normal limits. Presumably in the latter case the tendency to reduction of serum calcium stimulates the parathyroid glands, and their activity serves to maintain the calcium *status quo*. The kidneys, therefore, are not directly implicated in simple rickets, and yet a definite abnormal amino-aciduria has been found to occur, and to clear up under treatment with vitamin D.¹

Dent and Harris² have recently summarized present knowledge regarding the hereditary forms of rickets and osteomalacia in a most interesting discussion—a contribution to Sir Thomas Fairbank's birthday issue. 'Vitamin-D-resistant rickets' is the name usually given to a condition very like ordinary D-lack rickets, but which requires enormous doses of calciferol to heal it. Left to itself this disorder is constant and incurable, although the sufferers retain their muscular strength and may lose their symptoms in adult life. Crippling of varying degree occurs, and osteotomies may be necessary. Other points of difference from ordinary rickets include a familial incidence (the inheritance is apparently by an autosomal dominant gene), absence of low serum-calcium and tetany, absence of muscular weakness, and lack of any amino-aciduria. More detailed biochemical investigation reveals a decreased ability of the renal tubules to reabsorb phosphorus, a defective calcium-absorption from the gut and usually a low urinary calcium. The pathogenesis of this condition is not completely worked out. Neither a primary resistance to the action of vitamin D in intestinal absorption of calcium, nor a primary deficiency of renal tubular reabsorption (low Tm for phosphorus) can fully explain it.

A very similar condition sometimes appears for the first time during adolescence or in adult life. It seems very doubtful whether there is any basic difference between this and the early form of resistant rickets, although Dent claims that muscular weakness is here an outstanding feature,

VAN DIE REDAKSIE

RACHITIS, OSTEOMALASIE EN DIE NIERBUISES

Die vernaamste uitwerking van vitamien-D is op die dun-derm, waar dit die absorbering van kalsium en bykom-stiglik, fosfor, bevorder. Met eenvoudige rachitis as gevolg van vitamien-D-gebrek, is die serum-fosfor altyd laag, terwyl die serum-kalsium soms laag (met tetanie) en soms binne normale perke is. In laasgenoemde geval word die byskildkliere vermoedelik deur die neiging tot vermindering van serum gestimuleer en hulle werking dien om die kalsium in *status quo* stand te hou. Die niere is dus nie direk by gewone rachitis gemoeid nie, en tog is dit gevind dat 'n definitiewe abnormale aminosuur-urie voorkom en dat dit met vitamien-D-behandeling opklaar.¹

Dent en Harris² het onlangs huidige kennis aangaande die erflike vorms van rachitis en osteomalasie in 'n baie interessante bespreking opgesom—'n bydrae tot Sir Thomas Fairbank se verjaarsdag-uitgawe. 'Vitamien-D-weerstand-biedende rachitis' is die naam wat gewoonlik gegee word aan 'n toestand wat baie soos gewone D-gebrek-rachitis is, maar wat enorme dosisse kalsiferol verg om te herstel. Aan sigself oorgelaat, is hierdie toestand standhoudend en onge-neeslik, alhoewel die gevalle wat daaraan ly hulle spierkrag behou en hulle simptome op latere leeftyd mag kwytraak. Gebrekkigheid van verskillende graad kom voor en dit mag nodig wees om osteotomies uit te voer. Ander eienskappe waarop dit van gewone rachitis verskil, sluit 'n gesinsvoor-koms in (die oorerwing geskied waarskynlik deur 'n auto-somaal-dominerende geen), afwesigheid van lae serum-kalsium en tetanie, spierswakheid en van enige aminosuur-urie. Noukeuriger biochemiese navorsing openbaar 'n verminderde vermoë van die nierbuisies om fosfor te her-absorbeer, 'n gebrekkige kalsium-opname vanuit die derms en gewoonlik 'n lae urinêre kalsium. Die patogenese van hierdie toestand is nog nie heeltemal bepaal nie. Dit kan nóg deur 'n primêre weerstand tot die werking van vitamien-D by ingewandsabsorbering van kalsium, nóg deur 'n primêre gebrek aan nierbuis-herabsorbering (low Tm for phos-phorus) ten volle verklaar word.

'n Amper soortgelyke toestand kom soms vir die eerste keer gedurende die puberteitsjare of op volwasse leeftyd voor. Dit is baie twyfelagtig of daar enige wesenlike verskil tussen hierdie en die vroeë soort weerstandbiedende rachitis is, alhoewel Dent daarop aanspraak maak dat spierswakheid 'n opsigtelike kenmerk van hierdie toestand is, en dat 'n oormatige glisinurie mag voorkom. Simptome sluit skelet-pyne en 'n waggelende gang in. X-strale toon benige ver-sagting, dekalsifikasie en Looser se sones aan. Biochemies

and an excessive glycinuria may occur. Symptoms include bone pains and a waddling gait. X-rays show bony softening, decalcification and Looser's zones. Biochemically, as in all forms of active rickets or osteomalacia, there is a low serum-inorganic-phosphorus and a raised alkaline phosphatase.

The Fanconi syndrome is more complicated. Again there are adult and childhood forms. The inheritance here is of Mendelian recessive type. In the early form there are two basic biochemical abnormalities—one is a reduced renal tubular reabsorption of several substances and the other is a deposition of cystine in various organs of the body. The relation of these two curious anomalies to each other is unknown. There seems no doubt that a congenitally abnormal renal tubule is present, since micro-dissection of affected tubules has shown a short proximal portion with a narrow swan-like neck. Urinary findings include an excess of certain amino acids, glycosuria and albuminuria. Further, the urine is strongly acid, with high ammonia content, and the phosphorus content is high in comparison with the depressed serum-level. The rickets which develops is again caused by an excessive loss of phosphates in the urine and is also highly resistant to the action of vitamin D. Adult cases are very similar, except that the organ cystinosis apparently does not occur.

Another well-delineated syndrome is that of 'renal tubular acidosis'. This is not usually hereditary. The basic biochemical lesion appears to be an inability on the part of the renal tubules to excrete an acid urine. The urinary bicarbonate is high and the ammonia very low. In many ways this syndrome is closely comparable to the effects of Diamox, which inhibits carbonic anhydrase and so prevents tubular reabsorption of bicarbonate ion. The rickets (or osteomalacia) in this condition would appear to be related to the excessive loss of calcium into the urine, but there are many features which are incompletely understood. Renal calcification may occur and this, with the increased serum chloride, is indicated in the old name 'hyperchloraemic nephrocalcinosis'. The treatment of this disorder, as opposed to the others, lies in the provision of readily available alkali (a citrate/citric-acid mixture is the standard preparation).

There are two other very interesting varieties of osteomalacia associated with renal tubular damage. It sometimes occurs in Kinnier-Wilson's disease, together with more usual defects of amino-acid reabsorption. The basic lesion here is probably tissue damage caused by an accumulation of copper. Secondly, osteomalacia has been seen in myelomatosis together with amino-aciduria and renal glycosuria.

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is daar, soos met alle soorte aktiewe rachitis of osteomalasie, 'n lae serum-anorganiese fosfor en 'n verhoogde alkaliese fosfatase.

Die Fanconi-sindroom is meer ingewikkeld. Weer eens is daar die soorte wat gedurende die volwasse leeftyd en die kinderjare voorkom. Die oorerwing in hierdie geval is van die Mendelian resessiewe tipe. By die vroeë soort is daar twee grondliggende biochemiese abnormaliteite—die een is 'n verminderde nierbuis-herabsorbering van verskeie stowwe en die ander is 'n neerslag van sistien in verskeie organe van die liggaam. Watter verwantskap daar tussen hierdie twee eienaardige onreëlmatighede is, is nie bekend nie. Daar skyn min twyfel te wees omtrent die bestaan van 'n abnormaal aangebore nierbuis, aangesien mikro-disseksie van aangetaste buise 'n kort proksimale gedeelte met 'n swaanagtige nek getoon het. Urinêre bevindings sluit 'n oormaat van sekere aminosure, glikosurie en albuminurie in. Verder is die urien sterk suur met 'n hoë ammoniak-gehalte en die fosfor-gehalte is hoog in vergelyking met die verminderde serumvlak daarvan. Die rachitis wat ontwikkel, word weereens veroorsaak deur oormatige verlies van fosfate in die urien en is ook erg weerstandbiedend teen die werking van vitamien-D. Volwasse gevalle is baie soortgelyk, behalwe dat die orgaan-sistinese skynbaar nie plaasvind nie.

Nog 'n goed-onderskeie sindroom is die van 'nierbuis-asidose'. Dit skyn of die grondliggende biochemiese letsel 'n onvermoë aan die kant van die nierbuise is om urien met 'n suurreaksie af te skei. Die urinêre bikarbonaat is hoog en die ammoniak baie laag. Hierdie sindroom kom in baie opsigte ooreen met die uitwerking van Diamox, wat koolsuuranhidrasie onderdruk en op hierdie wyse buis-herabsorbering van bikarbonaat-ioon voorkom. Dit skyn amper asof die rachitis (of osteomalasie) by hierdie toestand in verband staan met die oormatige kalsiumverlies in die urien, maar daar is baie kenmerke wat nie volkome duidelik is nie. Nierverkalking mag voorkom en dit, tesame met die vermeerderde serum-chloried word aangedui deur die ou benaming van 'hiperchloremiese nefrokalsinose'. Die behandeling van hierdie ongesteldheid, in teenstelling met die ander, bestaan uit die voorsiening van maklik beskikbare alkali ('n sitraat/sitroensuur-mengsel is die standaard preparaat).

Daar is twee ander baie interessante variëteite osteomalasie wat met nierbuisbeskadiging geassosieer is. Dit kom soms by Kinnear-Wilson se siekte voor, tesame met meer algemene gebreke van aminosuur-herabsorbering. Hier is die grondliggende letsel waarskynlik weefselbeskadiging wat deur 'n ophoping van koper veroorsaak is. Tweedens is osteomalasie by mielomatose waargeneem, tesame met aminosuur-urien en nierglikosurie.

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CANCER AND ATHEROSCLEROSIS

A recent annotation in the *Lancet*¹ on this subject points out that pathologists have noticed that patients dying of malignant disease tend to have less atherosclerosis than those who die of other causes. The problems have been investigated by Elkeles² who confirms the clinical impression after radio-

logical investigation. Indeed, he has noticed a difference (greatest in patients aged 71-80) where 28% of the cancer group showed calcification of the aorta, compared with 72% showing the same effect in the control group. Creech *et al.*³ on the other hand, from an investigation of 1,225

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necropsies concluded that 'patients who had died of bronchial carcinoma had the same degree of atherosclerosis as patients with hypertension, and significantly more than the control population'. The matter is obviously not yet clearly understood, but some connection evidently exists between atherosclerosis and cancer.

The interest of this finding for investigators in South Africa is very great. In this country we have a portion of the population—the Bantu—who are not as liable to atherosclerosis as the Europeans. Efforts are, therefore, being made, by dieting, to reduce the incidence of the White Man's atherosclerosis to that of the Bantu. On the other hand it is notorious that it is the Bantu who is exclusively

affected by cancer of the liver, who suffers disproportionately from malignancy of the oesophagus and mouth and whose lack of resistance to cancer anywhere in his body is well known. This may well suggest that the Bantu's relative freedom from atherosclerosis is bought at a high price. There is 'evidence not amounting to proof' indeed, that you cannot both have your cake and eat it; if you want the supple arteries of the Bantu you may have to put up with his cancer of the liver.

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THE URINARY BLADDER

A SELECTED SURVEY OF NEW CONCEPTS ABOUT THE ANATOMY AND PHYSIOLOGY

P. J. MITFORD RETIEF, M.B., CH.M., CAPE TOWN

Isn't it a great pleasure to learn and relearn again.

Aphorisms of Confucius

The text-book description of the anatomy of the bladder as being a muscular sac and of the urethra as being a muscular tube with an involuntary sphincter at the bladder orifice and a voluntary sphincter in the urogenital diaphragm, seemingly presents no problem. The role which the somatic and autonomic nerves fulfil to enable the bladder to act as a reservoir for urine with periodic voluntary emptying has also been settled to the apparent satisfaction of the physiologist. It is the clinician facing the problems of incontinence who cannot accept the orthodox explanation and who is constantly seeking an answer to what so many have called 'the riddle of micturition'. Small wonder then at the steady spate of investigative contributions in the medical literature by gynaecologists and urologists regarding the anatomy and function of the bladder.¹⁻⁹

Embryology and Comparative Anatomy

The bladder arises from the hindgut, which is divided by the urogenital septum into a ventral and a dorsal cloaca. The ventral cloaca has an upper sacciform part which will become the bladder and a lower tubular part, abutting on the cloacal membrane, which is the urogenital sinus and which will form the posterior urethra of the male and the entire urethra of the female. The allantois is said not to take any part in forming the bladder, and the urachus is the attenuated upper portion of the ventral cloaca which maintains a ligamentous attachment to the umbilicus. The anterior urethra of the male derives from closure of the urethral folds and is ectodermal. The urogenital septum carried the mesonephric ducts into the urogenital sinus. The subsequent budding of the ureters and their cranial migration towards the ventral cloaca establishes the trigone of the bladder as being of mesonephric, i.e. mesodermal, origin.

Bors¹⁰ sees in this varied embryological development the significance of a varied nerve-supply, viz. parasympathetic for the ventral cloaca (detrusor), sympathetic for the meso-

nephric duct derivatives (vasa, seminal vesicles, ureters and trigone area) and somatic nerves for the urogenital sinus (urethra, pelvic floor and cloacal muscles).

From the viewpoint of comparative anatomy there are some features which are important. In mammals the bladder is an abdominal more than a pelvic organ so that the urethra is relatively much longer, and the urethral or Wilson's muscle is more significant. This is a layer of striated muscle fibres which envelops the entire urethra and which voluntarily empties the urethra of urine or semen. The interest of this striated muscle in animals is that a similar muscle is described in the male foetus¹¹ and it helps to explain the undoubted presence of striated muscle-fibres in parts of the posterior urethra other than the external sphincter area.¹⁰

The Detrusor Muscle

The plain muscle of the bladder is described as consisting of 3 layers which interlace freely. The middle layer is arranged circularly and the inner and outer layers longitudinally. The inner layer is the thinnest. The outer layer runs mainly from the front to the back over the vertex of the bladder and is deficient at the sides. The muscle fibres are arranged in bundles so that, when hypertrophied, they stand out as trabeculae, and the gaps in between form cellules. Deep cellules grow progressively with continued pressure to form diverticula, which are usually situated in the region of the ureteric orifices where the outer longitudinal layer is deficient. In chronic atony of the detrusor a general bulge in the lateral aspect of the bladder occurs, which has been called a 'hernia' of the bladder. The base of the bladder is relatively fixed and less distensible than the rest, so that filling is accomplished by progressive distension of the vertex.

The most characteristic function of the detrusor muscle is to encompass increasing amounts of fluid with little rise in pressure. It exhibits also the other features of plain muscle in that it possesses inherent tone and rhythmic contractions even when deprived of its nerve supply. Moreover, the reactions are sluggish, in keeping with the more primitive nature of plain muscle, as compared with striated

muscle. The detrusor will also respond differently to a similar stimulus depending on its initial state, so that it will dilate when contracted and contract when dilated in response to the same impulse.

The trigonal muscle, which is readily demonstrated anatomically, is a flat sheet of plain muscle lying under the mucous membrane of the trigone. It appears to be a continuation of the longitudinal muscle fibres of the ureters and extends over the posterior lip of the internal urethral orifice and blends with the longitudinal fibres of the urethra in the region of the verumontanum. This muscle would effect active opening of the urethral orifice (one of the contentious points in the mechanism of micturition), but its significance has somehow been overlooked by recent investigators.

Bladder Sphincters

Since urine is ordinarily held at the internal urethral orifice, the presence of a muscular sphincter at this site has long been presumed. There are numerous older descriptions of the manner in which this sphincter was formed, either by a local increase in the circular layer of the detrusor, or by various loops and slings contributed by various layers of the detrusor. Critical re-investigation by numerous later dissections has failed to establish the presence of an anatomical sphincter in this area and has led to the vague term 'urethral resistance', which expresses an inherent function of the whole urethra to remain closed when urine is not being voided.

Careful serial sections of the entire area from the bladder neck to the external sphincter area in both male and female have justified the following findings.²⁻⁷

1. The urethra is functionally and anatomically part of the bladder. They act in unison and the muscle fibres of the detrusor are continued into the urethra.

2. The male posterior urethra is complicated by having the prostate gland incorporated within it. This gland in the human has 25% muscular tissue and forms an integral part of the bladder neck and posterior urethra.

3. The external sphincter of striated muscle in the male can be demonstrated by dissection and lies between the upper and lower layers of the urogenital diaphragm. Striated muscle however is not confined to this narrow area, but extends upwards to encircle the apex of the adult prostate. In the foetus it forms a complete external coat up to the bladder; in children it becomes deficient posteriorly and latterly over the prostate but reaches the bladder anteriorly and in the adult it is found extending halfway to the bladder neck on the anterior aspect of the prostate. Isolated striated muscle-fibres have also been described in the region of the trigone of the adult.¹⁰

4. In the female urethra at the bladder neck the muscular fibres of the detrusor interlace so that lower down there is found an inner longitudinal and external circular layer. The poorly-developed inner longitudinal layer of the detrusor is apparently not continued into the urethra. No localized smooth-muscle sphincter exists at the bladder neck.

5. The urogenital diaphragm cannot be demonstrated with clarity in the female. In the middle third of the urethra there are striated muscle-fibres around the urethra which are seemingly continuous with the fibres of the bulbocavernosus muscle.

6. The distal part of the female urethra is intimately associated with the muscular layers of the vaginal wall.

7. The pubo-urethral ligament is a distinct fibro-muscular structure which fixes the proximal part of the urethra to the symphysis pubis. The male counterpart is attached to the front of the prostate.

8. The free edges of the levator ani (pubo-coccygeus) are closely applied to the proximal part of the urethra and the bladder neck. In the male they hug the sides of the prostate.

Nerve Supply of Bladder

The bladder and urethra are supplied by a group of 3 nerves, viz. (i) somatic nerves from the pudendal nerve (S 3 and 4) which give motor innervation to the voluntary sphincter and sensory appreciation of the posterior urethra, (ii) parasympathetic nerves via the nervi erigentes (S 2, 3 and 4) which constitute the motor supply to the detrusor and carry the main sensory afferents from the bladder. These are the main nerves of micturition. (iii) Sympathetic nerves via the hypogastric nerves, which arise by branches from the lumbar sympathetic ganglia and the aortic plexus.¹⁰ Section of these nerves does not affect micturition—their chief function is concerned with ejaculation in the male.⁹

Animal experiments and clinical observations on neurological cases have established the fact that a centre for micturition lies in the sacral segments of the spinal cord. The afferent and efferent components run almost exclusively with the parasympathetic pelvic nerves, since section of both the sympathetic and pudendal nerves hardly affects micturition at all. By pathways in the spinal cord, which have not as yet been accurately mapped, the sacral centre is controlled by centres, probably in the brain stem and the hypothalamus, in addition to a cortical centre for conscious appreciation and control. The subcortical centres are said to effect sustained detrusor contraction (at a subconscious level) so that the bladder is completely emptied. It is a controversial point whether the cerebral cortex directly activates the detrusor muscle or whether micturition consists of inhibition of the subcortical centres. The inhibitory theory is favoured at the present time.

Urothelium

The bladder is lined by transitional epithelium which imparts to it functions reminiscent of stratified skin epithelium. Since there are normally no mucous glands in the bladder, it is not a mucous membrane. The bladder epithelium has gross appreciation of touch and temperature and more acute sensibility of pain. It moreover commands a fair degree of localization; 68°F and 100°F are appreciated as cool and warm respectively. These sensory components are almost certainly conveyed via the parasympathetic afferents, since sympathectomy does not alter them. There is however evidence to suggest that certain painful stimuli from the bladder traverse afferent fibres in the sympathetic nerves^{9,12}. It is also suggested that vague sensations from the bladder may be conveyed from nerves supplying the adjacent peritoneum.

The bladder epithelium, apart from being an organ of sensation, also possesses limited absorptive ability. Certain animals are known to use the bladder as a source from which fresh water is absorbed in addition to its use as a reservoir for unwanted fluid waste. A variety of salts and

other substances from the bladder can be reabsorbed but alkaline rate.¹² A significant production of a very small amount of which are lithium, is a basic fluid of fluid in full capacity to void it by the p

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other substances are known to be absorbed in small quantities from the bladder of most animals. The normal urothelium can be regarded as an inefficient semi-permeable membrane, but alkalinity and inflammation increase the diffusion rate.¹² On occasions this reabsorption may be clinically significant as, for instance, in allowing continued urine production in acute retention.

A very important sensory function of the bladder wall, which arises from the muscle layers rather than the epithelium, is the appreciation to filling. This 'stretch reflex' is a basic function of bladder muscle to which it responds as a spinal reflex by steadily relaxing so that an increasing volume of fluid is held at low pressure, until the bladder reaches its full capacity, when the pressure rises steeply and the urge to void is urgent and imminent. This sensation is conveyed by the parasympathetic nerves.

Cystometry

A cystometrogram is a graphic record of the spinal reflex of the bladder, and much of the knowledge of bladder behaviour has been gained by its use. A cystometer can be simply and inexpensively assembled and the method consists simply of introducing a measured amount of fluid into the bladder and recording its pressure.¹³⁻¹⁵ The method of McLellan¹⁶ agrees in principle with most other methods and can be cited as an example.

The cystometrogram is affected by local pathology of the bladder as in infection or bladder-neck obstruction and by neurological lesions and the information gained must be critically weighed with the rest of the clinical findings. It is a help in the diagnosis of disordered bladder function, but is by no means a robot which supplies the diagnosis by a twist of the dial.

Cystometric studies in infants and children demonstrate graphically what is observed in their bladder habits. As the nervous system matures, higher centres take increasing control until the adult type of bladder is found from about 5 years onward.¹⁹

Cystometry has revealed an interesting physiological atonicity of the bladder during pregnancy. This commences from the 3rd month onwards so that the bladder has a larger capacity, diminished sensation and a flat cystometric curve. During the last month of pregnancy the tone improves, but during the puerperium it once more becomes remarkably atonic with a capacity up to 1,500 c.c. and with quite considerable residual urine.¹⁵

Radiography

Recently there has been considerable interest shown in the use of radiography as a means of studying the normal and pathological bladder, especially in regard to incontinence. Most of this work has come from the gynaecologists in their attempts to explain stress incontinence. A most useful method is the voiding cysto-urethrogram. By using a fluid of dense radio-opacity the bladder and urethra can be viewed from all angles, including the true lateral, and one can visualize exactly what is occurring during micturition, especially when cineradiography is employed. Cysto-urethrograms have added considerably to our knowledge about the bladder and urethra, particularly in females. The female urethra is shown to be much more than a mere tube and it possesses definite anatomical features. These features have been confirmed by cast studies of the urethra.

The normal adult female urethra varies in length from 2½ to 4 cms. and shows,²⁰

- (a) A course tangential to the bladder.
- (b) An even convexity upwards.
- (c) A wide urethro-vesical angle.
- (d) Two dilatations separated by a narrow area between the middle and distal thirds.

Voiding cysto-urethrograms have shown that definite and constant changes occur in the bladder and urethra and also in the pelvic floor during micturition. These changes are found in both males and females, as follows:^{6,8,20}

- (a) The bladder base descends.
- (b) The shape of the bladder alters from round to ovoid.
- (c) The urethro-vesical angle in the female is almost straightened out.

It is quite evident that apart from the action of the intrinsic bladder and urethral muscles, the muscles of the pelvic floor play a part in micturition.

At the present time much useful knowledge is being gleaned from cineradiography of the act of micturition. In this way it is possible to see exactly how fluid is voided from the bladder and the mechanism of voluntary control. Apart from minor differences between various investigators, a definite sequence of events occurs when voluntary micturition takes place: (a) the detrusor contracts, (b) the internal urethral orifice opens, (c) the bladder base descends, and (d) the external sphincter opens. This sequence occurs when the subject has a desire to void. When the bladder is uncomfortably full and the patient has to resist micturition actively, the detrusor is found to be contracted, the internal urethral orifice is open, and the bladder base is raised. On the command to void, the base descends and the external sphincter opens.

Since elevation of the bladder base must be effected mainly by the levator ani muscle and to a less extent by the perineal muscles, these muscles are important accessory muscles of micturition. Their action is also clearly demonstrated in the voluntary control of micturition, when the following sequence of events is shown by cineradiography on the command to 'hold it': (a) contraction of external sphincter and cutting off of the stream in mid-urethra, (b) elevation of bladder base, (c) relaxation of the detrusor, and (d) emptying of the proximal urethra upwards into the bladder and closure of the internal urethral orifice.

These findings have confirmed but added very little to the knowledge of the mechanism of micturition which was first suggested by Denny-Brown and Robertson in 1933.²¹ It remains to consider the mechanism in relation to the nerve supply and the following is largely a summary of what has been considered before.

BLADDER CONTROL AND MICTURITION

It is found that the bladder acts as a reservoir for urine, which is held at the internal urethral orifice.

As the bladder fills, the bladder wall relaxes to hold its content at a low pressure of only a few c.c. of water. This is a reflex between afferent and efferent fibres of the pelvic nerves and a centre in the sacral part of the cord, which may be controlled subconsciously by centres in the brain stem and hypothalamus. When about 100-150 c.c. of urine has accumulated, the subject becomes aware of bladder fullness by pathways reaching the cerebral cortex. Filling

is usually allowed to proceed by inhibition from the cortex over the lower centres until a capacity of nearly 300 c.c. is reached. This inhibition permits the bladder muscle to continue relaxing so that the pressure remains low. Whereas the normal reaction of the sacral centre would be to excite rhythmic contractions of the detrusor, it is coerced by the cortex to dampen these down. The subjective sensation of a full bladder becomes progressively more unpleasant as the bladder nears its capacity and if circumstances are convenient voluntary micturition ensues. Should the bladder become uncomfortably full, active voluntary restraint is needed. The pressure in the bladder now reaches 50 cm. and more, and active contraction of the external sphincter and accessory muscles of the pelvic floor is employed. At this stage the detrusor is contracted and the urethra up to the external sphincter is filled. Before this stage is reached urine remains contained at the bladder neck, and the accessory pelvic muscles are contracted reflexly only if a sudden increase in abdominal pressure occurs, as with a sneeze or cough. It is clear that thus far the bladder functions by nerve impulses *via* the parasympathetic nerves and somatic nerves to the levator ani, since section of both sympathetic nerves and pudendal nerves does not materially alter the function, whereas damage to the pelvic nerves or sacral centre renders the bladder completely inefficient.

Voluntary micturition can be actively initiated at any stage of bladder filling. When the bladder is almost empty, however, initiation of the act often requires help from straining by increasing intra-abdominal pressure. Normally however the detrusor is set in motion by removal of cerebral inhibition and straining is not needed. Once the detrusor contracts, it continues to do so until all the urine is expelled and this sustained contraction only occurs if the connections between the sacral centre and certain subcortical centres are intact.

The internal urethral orifice opens only when the detrusor contracts and when the pressure within the bladder is between 30 and 50 cm. During micturition the pressure continues to rise to between 50 and 150 cms.

It is believed that the pelvic nerves are the motor nerves to the detrusor. At any point during micturition the act can be terminated by voluntary contraction of the external sphincter, which is innervated by the pudendal nerve. The external sphincter is assisted by contraction of the muscles of the pelvic floor in both male and female, but probably particularly so in females. What role then do the sympathetic nerves play in bladder function and micturition?²³ They probably assist but are dispensable, since sympathectomy in no way affects efficient bladder function and control in many animals and in man. In some animals, however, the bladder after sympathectomy becomes spastic and irritable.

Various observations have shown that the sympathetic apparently carries motor fibres to the muscular coats of the ureters and genital ducts in the male, and probably also to the trigone area. It has been suggested that the sympathetic nerves actively effect closure of the internal orifice, particularly during ejaculation. It has also been suggested that motor sympathetic fibres cause contraction of the trigonal muscle, which opens the internal urethral orifice. These are confusing and opposite actions. It seems that the parasympathetic pelvic nerves effect contraction of the detrusor and simultaneous relaxation of the proximal urethra. It is of course no unusual event for autonomic nerves to have an opposite effect on the tone of the innervated muscle. The method of opening of the internal urethral orifice remains one of several riddles in the understanding of the mechanism of micturition.²³

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ABSTRACT : UITTREKSEL

Treponema Pallidum Immune Adherence (TPIA) Test in Diagnosis of Syphilis. James N. Miller *et al.* *Jour. Amer. Med. Ass.*, **163**, 112. 12 Jan. 1957.

The *Treponema pallidum* immobilization or TPI test is difficult and expensive and employs living treponemes. The TPIA test is based on the principle that *T. pallidum* when sensitised by specific antibody in the patient's serum adheres to the surface

of human red blood cells in the presence of complement. This does not take place in the presence of normal serum and complement. Killed *T. pallidum* are used as antigen. This antigen remains stable for at least six months. The TPIA test agrees with the TPI test as regards specificity, but appears to be more sensitive.

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THE NEUROGENIC BLADDER

H. CURRIE BRAYSHAW, M.B., Ch.B. (EDIN.), F.R.C.S. (ENG.), F.R.C.S. (EDIN.)

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Unlike skeletal muscle, smooth muscle can function in the apparent absence of neurogenic innervation and control. The old theory that stimulation of the sympathetic fibres contracts the vesical neck and relaxes the detrusor muscle, and that in micturition it is stimulation of the para-sympathetic that relaxes the vesical neck and initiates contraction of the detrusor, has been proved to be wrong, for normal micturition can occur after complete section of the sympathetic nerves.

WHAT CAUSES CONTRACTION OF THE DETRUSOR MUSCLE?

This is probably a 'stretch reflex' initiated through afferent and efferent fibres with a reflex centre for micturition in the spinal cord. This stretch reflex however, is different from the lengthening reflex of skeletal muscle, for if the reflex arc is broken the skeletal muscle is flaccid, but in the bladder tone remains even when the nerve supply is completely severed. The normal bladder holds urine at a remarkably low pressure regardless of the amount and degree of vesical distension. Normally the intravesical pressure is about 7-8 cm. of water and desire to micturate only comes on when the pressure rises to 14-16 cm., but the vesical neck will not open until reflex contraction of the detrusor occurs, and then the vesical pressure may rise as high as 150 cm. of water. The external sphincter can be voluntarily closed but not voluntarily opened; it can only open in conjunction with reflex contraction of the detrusor.

Section of both pudendal nerves does not disturb the normal act of micturition, nor does it cause incontinence; either the vesical neck or the external sphincter can maintain urinary continence. Section or stimulation of the presacral nerve has no effect on the act of micturition. Under spinal or sacral anaesthesia the patient is unable to initiate urination and there is no incontinence in the lying or sitting position. In this way the state of affairs resembles that of the neurogenic bladder resulting from section of the para-sympathetic fibres (i.e. nervi erigentes or pelvic nerves) or destruction of the sacral portion of the cord. Stimulation of the parasympathetic fibres causes forceful contraction of the detrusor, except when the bladder is in a state of tonic contraction, in which case it will cause relaxation. Afferent impulses of the micturition reflex traverse the pelvic nerve.

NEUROGENIC THEORY OF MICTURITION

The reflex arc involves afferent fibres and efferent fibres (parasympathetic) which run *via* the pelvic nerves or nervi erigentes. The centre is believed to be in the sacral portion of the cord (conus medullaris). The maintenance of a more or less low intravesical pressure during filling is considered to be the result of the natural tone of the vesical musculature.

an inherent property of smooth muscle, and it is not dependent on nerve supply. Impulses which may cause contraction of the detrusor muscle are inhibited by impulses from centres in the brain.

MECHANISM OF MICTURITION

At rest, all the muscles of the perineum except the external sphincter are relaxed. When the detrusor contracts the vesical pressure rises; at 20-45 cm. of water the vesical neck opens, and then the external sphincter suddenly relaxes and urine flows. The detrusor continues contracting until the last drop of urine is passed, then the detrusor relaxes, the external sphincter contracts and, lastly, the vesical neck closes more slowly.

NEUROGENIC VESICAL DYSFUNCTION

Under this are grouped all forms of dysfunction which result from lesions of the central or peripheral nervous system. As stated above, the reflex centre for micturition is in the sacral segment of the cord, probably in the conus medullaris. Thus we speak of supranuclear lesions or infranuclear lesions. Animal experiments have established the fact that in transection of the spinal cord (supranuclear) there is little change in the appearance and function of the bladder, but the destruction of the conus or cauda equina, or section of both pelvic nerves (erigentes) or anterior roots of both pelvic nerves, causes marked thickening, hypertrophy and trabeculation of the bladder wall.

The *acute stage* of a 'cord bladder' occurs immediately after cord injury regardless of the level of the injury and is characterized by complete loss of reflex activity below the level of the lesion. The cystometrogram shows a flaccid bladder with a low pressure curve, and there is no sensory awareness of vesical distension or desire to void. The bladder becomes distended and overflow dribbling occurs. It was thought that the detrusor lost its 'tone' but this has been shown not to be true. The bladder is usually drained for weeks or months and then enters into the chronic or recovery stage.

The *chronic or recovery stage* is characterized by (a) impairment of urinary control, (b) signs of active incontinence, and (c) a substantial amount of residual urine. The outstanding change is the inability to accommodate readily and quickly any increase in the volume of urine. These signs all vary according to (1) the severity of the lesion, (2) the situation, (3) whether the lesion is complete or incomplete, and (4) whether the lesion is supranuclear (i.e. lumbar or thoracic) where the reflex arc is intact, or infranuclear (conus medullaris or cauda equina) where the reflex arc is destroyed.

What do we mean by urinary control? By urinary control is meant (1) recognition of the desire to micturate, (2) ability to inhibit or postpone urination until one is able to reach a lavatory, and (3) ability to initiate urination voluntarily.

COMPLETE LESIONS

Nuclear or Infranuclear Lesions

This type is usually referred to as the autonomous or non-reflex bladder. The reflex arc has been interrupted by destruction of either the sacral segment of the cord, or the cauda equina, or the pelvic nerves (erigentes) which carry the motor parasympathetic and sensory fibres controlling the bladder. It is characterized by the following symptoms, and clinical signs:

(a) *Vesical Sensation is Abolished.* The desire to urinate has disappeared although a vague sensation of suprapubic or perineal fullness may be transmitted by the presacral nerve. This sensation may arise from the nerve plexuses in the peritoneum overlying the bladder, and the higher the lesion the less there is of this type of sensation.

(b) *Voluntary Control is Lost.* The ability to inhibit or initiate urination is lost and there is little or no reflex bladder activity. Urine is evacuated in irregular intermittent spurts, and usually in such low lesions the abdominal musculature is intact and the patient can express some urine by straining or by manual expression (Credé expression). This is one of the distinctions between a bladder in which the reflex arc is intact and one in which it is destroyed.

(c) *Large Quantity of Residual Urine.* The capacity of bladders vary. It is difficult to estimate; for instance, there may be 400 c.c. of residual urine and yet on cystoscopy one cannot introduce 100 c.c.

On cystoscopic examination the appearance of the bladder varies according to the duration of the lesion. There is usually marked trabeculation, the vesical wall is thickened and hypertrophied and difficult to distend because of its inability to accommodate to distension. The vesical neck appears thick and hypertrophied and may resemble an obstructive adenomatous collar. This type of bladder is inefficient, since the small difference between the amount of residual urine and the total capacity leaves little reservoir function.

Supranuclear Lesions

Where the lesion is above the sacral segment of the cord, the reflex arc for micturition remains intact, and this results in an *automatic or reflex bladder*.

Involuntary evacuation of urine occurs at more or less regular intervals, determined by the intravesical volume of urine. In an efficient reflex bladder the interval may be one of several hours. The patient has no sensation of the bladder filling and no desire to void, but there may be certain 'aurae' e.g. sweating, headaches, abdominal discomfort. There may also be certain 'trigger points' supplied by the nerves from the sacral segments, so that pinching of the skin of the perineum, anus, scrotum, or vulvae may induce micturition. The amount of residual urine varies; it is the best method of measuring the efficiency of the bladder. The majority of reflex bladders are inefficient and carry a large quantity of residual urine. Their capacity varies—hence such terms as hypotonic and hypertonic, spastic or irritable bladder; in the last the capacity may be so small and the interval so short that it simulates the intermittent spurts of the non-reflex bladder. The irritability may be increased by infection, stone, or mass reflexes of the lower limbs. Munro maintained that tidal drainage prevented the development of an irritable reflex bladder, but this is doubt-

ful. On cystoscopy there is trabeculation and hypertrophy of the detrusor and vesical neck but this is not so marked as in the non-reflex type of bladder.

A cystometrogram may furnish some interesting information. Firstly normal vesical sensation is lost; some abdominal discomfort may however be present probably due to the stretching of the peritoneal covering of the bladder. The intravesical pressure is more or less normal, as shown in the pressure curve, minor rhythmical contractions occurring periodically until the bladder capacity is reached, and then a violent contraction occurs and urine is evacuated. This picture may vary in the case of a spastic or irritable bladder.

Differentiation between Nuclear and Supranuclear Lesions

The lower thoracic, lumbar and sacral segments of the cord lie close together in a relatively small area bounded by D 11 and L 12 and L 1, and it is thus extremely difficult to determine the exact level of the lesion in injuries in this region. Bors' bulbo-cavernosus and anal reflexes are useful to know; with the finger in the rectum, squeezing or pricking the perianal skin causes contraction of the anal sphincter, this indicates that the reflex arc is intact. Spasticity of the anal sphincter also indicates an intact conus.

INCOMPLETE LESIONS

It is generally agreed that the *first or shock phase* which immediately follows cord injuries is represented by the atonic neurogenic bladder. The cystometrogram resembles that seen in patients with lesions of the posterior sacral roots (e.g. tabes dorsalis) which involves only the sensory fibres of the reflex arc. The *second stage* of recovery from a lesion at any level in the cord is characterized by weak minor contractions probably due to the activity of ganglionic plexuses in the bladder wall as distinct from reflex activity through the normal reflex arc, and thus resembles the non-reflex or autonomous bladder, which is the final stage of a complete nuclear lesion. The *third stage* of recovery is characterized by reflex vesical activity, the bladder now coming under the control of nervous impulses through the reflex micturition centre in the sacral segment. The bladder empties at periodic intervals, and is not under the voluntary control of the patient. Bladder sensitivity is lost, there is no desire to void, and the patient is unable to inhibit or initiate detrusor activity. Further gradual recovery may take place, and finally there may be only minimal deviation from the normal; this may be represented clinically by imperative or precipitate micturition, often referred to as urgency incontinence.

So many classifications of neurogenic bladders have been introduced, and so much confusion exists that Bors' classification is probably the most practical; it is based on the level of the lesion, completeness of the lesion, and efficiency of the bladder determined by the amount of residual urine compared with the bladder capacity (i.e. bladder balance). On *cystoscopic examination* the majority of cord bladders are trabeculated by the time they reach the chronic stage. This is more marked in the non-reflex or autonomous bladder. Trabeculation is associated with hypertrophy of the detrusor and vesical neck. There is loss of ability to accommodate increased quantities of fluid, especially if rapid, for this may pull open the vesical neck and give the appearance of a 'writhing muscle'. Sometimes the vesical neck looks like an adenomatous collar.

Cystoscopy may show trabeculation, sacculation and diverticula. On the other hand ureteric reflux may indicate commencing damage of the upper urinary tract. The value of a cystometrogram is doubtful, for so many different techniques have been introduced that its interpretation is difficult.

ANALYSIS OF BASIC PROBLEMS

In the acute or shock stage there is loss of reflex activity below the lesion, the bladder becomes distended if not relieved by drainage, and overflow dribbling occurs. The problem is therefore drainage and control of infection. In the chronic stage we are faced with numerous problems:

(a) *Incontinence.* In the past it has been assumed that incontinence is due to paralysis, relaxation, or loss of the tone of the sphincters. This is not so; there is normally increased tonicity of the sphincters. The reason of the incontinence is the repeated, irregular and unsuccessful attempts of the bladder to evacuate its contents. It is thus more active than passive incontinence and effort should be directed not to tightening the sphincters but towards improving the detrusor activity and promoting reciprocal relaxation of the sphincters.

(b) *Residual Urine.* This results from inability of the bladder to expel its contents, and constitutes the main problem of neurogenic vesical dysfunction. Eliminate residual urine and the urinary problems of a paraplegic patient disappear. The amount of residual urine is at present the chief factor in determining the efficiency of a cord bladder. Why is a cord bladder unable to expel its contents? In a reflex bladder, i.e. in a supranuclear lesion, the reflex arc is intact; the vesical tone is normal or slightly raised and the expulsive power of the reflex vesical contraction as measured cystometrically may be as great as in a normal bladder or far greater. Why then is the urine not completely expelled? It may be due to the fact that reciprocal relaxation of the vesical neck is absent or defective, or that the contraction of the detrusor is not sustained, because of severance from the brain stem.

In a non-reflex bladder, the reflex arc being destroyed, the detrusor contraction is dependent on the myoneural contractions arising from the intrinsic nerve plexuses in the bladder wall. These contractions are small and of poor quality, but this type of bladder is very hypertrophied, and the intravesical pressure is high and will rapidly respond to abdominal straining; and there is always the possibility of the hypertrophied vesical neck acting as an obstruction. The perineal muscles and external sphincter in all cord injuries above the sacral segment should, like other somatic muscles, show increased tonicity and spasticity. The important advances in the treatment of neurogenic bladder have been directed towards reducing the spasticity of the sphincters.

(c) *Frequent Irregular Voiding.* This is the most troublesome feature of a cord bladder, the loss of the reservoir function of the bladder due to the relatively small difference between the residual urine and the vesical capacity. The loss of inhibitory influences from the brain, trigger impulses leading to mass reflexes, stone, infection and finally fibrotic contracture of the bladder probably also contribute to this troublesome feature.

(d) *Loss of Vesical Sensation.* This is due to the interruption of the sensory pathways through the pelvic nerves,

posterior roots and conus. A vague sensation of abdominal discomfort may be present but in supranuclear lesions this becomes less and less and ceases altogether at the level of D. 6. Lesions above this level present headache, sweating, chilly feeling etc., and even paroxysmal hypertension. Nothing can be done to improve the sensory loss, and effort should be directed to circumvent this disability by reducing the residual urine and thus increasing the reservoir of the bladder. Patients should be taught to recognize the abnormal signs mentioned above, and establish 'trigger points' which will initiate micturition and to void regularly by straining and by manual compression.

TREATMENT OF NEUROGENIC VESICAL DYSFUNCTION

In immediate treatment in the shock stage intermittent catheterization or manual expression is dangerous; therefore a small in-dwelling catheter should be used, preferably a Fr. 4 Foley bulb catheter, which should be changed under the strictest aseptic precautions every 10 days, the urethra being carefully irrigated with an antiseptic lotion before the new catheter is inserted. The catheter should be connected to some form of closed drainage, with periodic automatic bladder-lavage. Cosbie Ross recommends the use of a long thin polythene tube, which he claims can be retained for 8-10 weeks. The occurrence of severe urethritis and peri-urethral abscess may necessitate a suprapubic cystostomy; this should be avoided if possible. It is vital during the initial treatment to prevent over-distension of the musculature, to prevent the development of a small contracted fibrotic bladder, and to reduce infection. The patient must take large quantities of fluids and the urine must be kept acid, which is best done by giving acid sodium phosphate, for it is necessary to provide the phosphoric acid radicle to combine with the increased excretion of calcium as a result of the demineralization of the skeleton caused by long recumbency. Periodic courses of antibiotics are also advisable. The condition of the upper urinary tract should be checked periodically by blood-urea estimations and by intravenous pyelography.

When should drainage be discontinued and 'bladder education' be started? This is a difficult question to answer. Generally speaking it is best to wait until there is evidence of return of reflex activity. The patient should be in good condition, with all decubitus ulcers healed and preferably up in a wheel chair and beginning to learn the use of crutches etc. This usually takes from 3 to 6 months. Bladder training is carried out by clamping the catheter for 1-1½ hours, then opening the catheter and getting the patient to void through the catheter. The length of time the catheter is clamped is gradually increased to 3 hours. Finally the catheter is removed and the patient must void urine by the clock. This may be encouraged by his finding some trigger point, or raising himself on his hands, or pulling on the monkey chain. Bladder training is obviously useless in a non-reflex or autonomous bladder, in the stage of shock, or if a mass reflex is present.

What is the next stage in the treatment? Some optimists such as Munro and Prather consider that by educational methods most patients should develop a socially compatible reflex or automatic bladder with less than 90 c.c. of residual urine. Most authorities do not share this view, for although automatic micturition may occur at regular intervals the efficiency with this large amount of residual urine is low.

SURGICAL TREATMENT OF CHRONIC NEUROGENIC VESICAL DYSFUNCTION

Firstly it must be assumed that all forms of conservative treatment have been exhausted before any surgical treatment is considered. Little if any improvement can be expected in a year. All advances in the treatment of neurogenic vesical dysfunction have been directed towards reducing the tonicity or spasticity of the vesical sphincters, the bladder neck, the external sphincter, and the muscles of the perineum.

Transurethral Resection of the Vesical Neck. As far as can be ascertained this procedure was performed the first time for neurogenic vesical dysfunction at the Mayo Clinic in 1937. The patient had sustained a fracture of the 12th thoracic vertebra 9 years previously. There had been partial recovery and he was able to walk with a stick but had had to employ routine catheterization for 7 years. He complained of urgency incontinence or precipitate urination before he was aware of his bladder being full. There was 300 c.c. of residual urine, and cystoscopy revealed a trabeculated bladder with a mild fixation and contraction of the bladder neck. If the bladder was emptied by catheterization the patient was able to hold his urine for 5 hours without any precipitate urination. Transurethral resection was carried out and the result was excellent. The patient was able to pass urine with an excellent stream and there was no residual urine and no urinary incontinence. This stimulated the urologists at the Mayo Clinic to try transurethral resection in all types of cord bladder—nuclear and supranuclear, complete and incomplete lesions, and in neurological lesions other than transection of the cord.

Indications for Transurethral Resection of Bladder Neck. There is no adequate method of selection but in general the non-reflex bladder (lesions of the sacral cone) seem to do better than the reflex bladder of higher lesions, especially if the lesion is low enough to spare the abdominal muscles. These cases with a large residual urine and marked hypertrophy of the detrusor, with an obstructive-looking bladder-neck, respond well to this operation. In these cases with abdominal straining the intravesical pressure may be raised to a higher level than normally required to initiate micturition, and this suggests some obstructive element. After resection the residual urine diminishes, the tendency to infection becomes less, and in some cases hydro-ureter and hydronephrosis disappear. Gershom Thomson and Emmett at the Mayo Clinic contend that transurethral resection must be complete; i.e. the whole circumference of the bladder neck should be resected and deeply—if necessary in 2 or more sessions—even though there would appear to be little tissue to be removed. Cosbie Ross and other urologists in England state that it is only necessary to do a posterior resection. Emmett claims 90% of good results in all incomplete lesions, irrespective of the level of the lesion, the most brilliant results being obtained in cases of 'urgency incontinence', and in those cases with a distended bladder associated with marked straining but no incontinence, or incomplete retention. The typical automatic bladder with hourly involuntary evacuation of urine gave the worst results.

Spasticity of the External Sphincter and Perineal Muscles. If transurethral resection fails to relieve the apparent obstruction consideration should be given to the possibility

that the obstruction is in the region of the external sphincter. The normal response of skeletal muscle to an upper-motor-neurone lesion is to become spastic. Urethrographic studies after transacral block and pudendal nerve block are thus of great value in deciding whether pudendal neurectomy will succeed. In a normal cysto-urethrogram the external sphincter appears in a neutral position, and there is no change during pudendal block. Munro suggested anterior rhizotomy of T. 11 to L. 5 to abolish the extravesical mass reflex which seemed to excite bladder contraction but he insisted that the sacral roots should not be divided. Bors suggested subarachnoid injection of alcohol to eliminate this mass reflex, and found that this led to a marked improvement in the bladder. He did not, however, appreciate that this was due to the relaxation of the external sphincter. Obviously injection of alcohol can only be used in complete lesions. Many patients with complete lesions refuse this form of treatment, because it abolishes erections, for even in complete lesions many patients are capable of sexual intercourse.

Pudendal Nerve Block and Section. As long ago as 1899 Rochet described 2 cases in which he successfully carried out pudendal neurectomy for relief of retention which he considered to be due to the spasm of the striated muscle of the posterior urethra. In 1939 Higgins advocated the operation in conjunction with presacral neurectomy. The pudendal nerve takes its origin from S2, S3 and S4. It leaves the pelvis through the lesser sciatic notch, where the nerve is closely associated with the internal pudendal artery. At the ischial tuberosity it divides into its terminal branches, viz. the perineal nerve and the dorsal nerve of the penis. In Alcock's canal it gives off the inferior haemorrhoidal nerve, which passes medially to innervate the external sphincter of the anus. The perineal nerve lies more medial and is separated from the dorsal nerve of the penis by the artery. It runs forward and downwards on the medial aspect of the ischial tuberosity to perforate the obturator fascia just posterior to the urogenital diaphragm.

Operative Technique. The patient is placed on his face and the table is angled at the pelvis so that the hips are flexed almost to a right angle. An oblique incision is made from the lower part of the sacrum to a point just medial to the ischial tuberosity. The fibres of the gluteus maximus are split and retracted; deep to it the sacro-tuberous ligament is exposed and can be divided; the obturator fascia is incised, and the yellow fat of the ischio-rectal fossa now protrudes. A finger inserted along the medial surface of the ischial tuberosity can usually palpate the internal pudendal artery. Immediately caudal to this and hence more superficial is the pudendal nerve. The inferior haemorrhoidal nerve is usually given off more proximally in Alcock's canal and the nerve then divides into the dorsal nerve of the penis and the perineal nerve, the artery lying between them. The nerve should be divided as high up as possible and a portion removed, even including the inferior haemorrhoidal nerve supplying the external anal sphincter, paralysis of which does not seem to matter in spinal injuries.

Subarachnoid Injection of Alcohol has been advocated by some surgeons, but it must be remembered that if this procedure is carried out in a supranuclear lesion it may destroy the micturition centre, which will convert a reflex bladder into a non-reflex bladder, produce more extensive anaesthesia, and abolish penile erections. It is however of

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value in abolishing the mass reflexes of the lower limbs which, apart from being painful, render any form of bladder control impossible.

Technique. The patient is placed on his side with no pillow under his head, but a large pillow is placed between his knees. The foot of the bed is raised on two chairs to obtain the maximum elevation of the pelvis and legs. The injection is made through the interspace between L.1 and L.2 by means of an 18-gauge spinal needle; 5 c.c. of cerebrospinal fluid are

removed and 10 c.c. of absolute alcohol injected slowly. The patient is then rolled over on his back, and inasmuch as the alcohol is lighter than cerebrospinal fluid, the foot of the bed must remain elevated for at least 24 hours.

SUMMARY

In the treatment and rehabilitation of paraplegics, one of the main problems is the management of the 'neurogenic bladder'. This paper outlines the subject.

HAMARTOMA OF THE NECK

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Baragwanath Hospital

Hamartoma, derived from the Greek word hamartanein (fail, miss, err) was coined by Albrecht¹ as a designation for 'tumour-like malformations showing a faulty mixture of the normal components of the organ in which they occur.' The abnormality may take the form of a change in quantity, arrangement or degree of differentiation, or may comprise all three.

Hamartoma is a rare entity.² Tumours under this name have been described in most organs of the body and especially in the lungs and kidneys. Albrecht's original cases were in the liver. In the region of the neck a hamartoma as such has only been reported in the thyroid gland.³ The following case, diagnosed as a hamartoma histologically and occurring in the subcutaneous tissues of the neck is therefore unusual. It is also interesting because radiologically phleboliths were found to be present in the soft tissues.

CASE REPORT

S.H., a 23-year-old Coloured male was admitted to Baragwanath Hospital on 20 March 1956 complaining of a painless swelling of the left side of the neck which he had first noticed 7 months before. The swelling was becoming larger and blood had been aspirated from it at another hospital 3 months before his admission to Baragwanath Hospital.

Examination. A soft, slightly fluctuating, lobulated, non-tender mass, approximately 6 cm. in diameter was present in the posterior triangle of the left side of the neck. The tumour was fairly well demarcated and the overlying skin freely movable and of normal appearance. Hard calcareous nodules could be felt in it. A similar but smaller lump could be palpated in the left anterior triangle of the neck.

Clinically it was felt that the swelling was either a haemangioma, since blood had been aspirated from it, or a tuberculous mass of glands with patches of calcification in it.

X-ray of the neck (Fig. 1) showed a soft-tissue mass in the left side of the neck with small rounded opacities in it. These were considered to be phleboliths, and accordingly the mass was compatible with a cavernous haemangioma. Two phleboliths were seen to overlie the apex of the left lung, suggesting that the mass in the anterior triangle extended into the chest.

It was decided to remove the mass and this was undertaken on 22 March under general anaesthesia. Whilst intubating the patient the anaesthetist noticed a swelling in the region of the left vocal cord which he thought had the appearances of a haemangioma.

Operation. The area was widely exposed by a transverse incision in the posterior triangle. The skin was reflected and the very vascular tumour mobilized. Much of the mass was removed but not all because of the profuse bleeding.

Histological report by Dr. I. W. Simson of the South African

Institute for Medical Research: 'Section of the specimen from the neck shows the presence of channels lined by a layer of flattened cells and containing blood. The wall consists of fibrous tissue and smooth muscle tissue and striated muscle is observed in one area. A lymph node showing non-specific inflammatory change

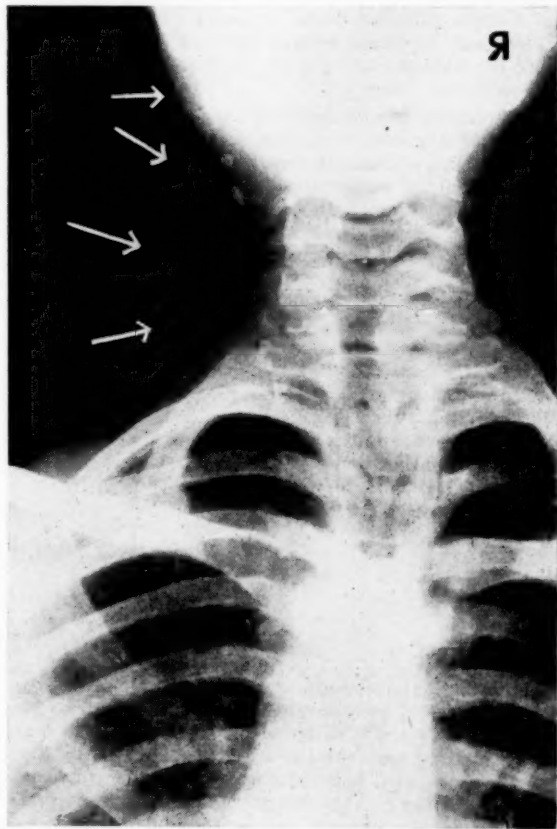


Fig. 1. Radiograph of the neck. The arrows demarcate the outer aspect of the soft-tissue mass. Note the phleboliths in the mass and also overlying the left apex of the chest, suggesting extension of the mass downwards into this region.

is attached to the specimen. The histological features are those of a simple hamartoma.⁷

DISCUSSION

There appears to be considerable doubt among pathologists about the relationship between hamartomata and the angiomas. Ewing⁴ defines an angioma as a 'true neoplastic process involving vascular tissue', and hamartoma as 'not a true neoplasm but tumour-like nodules resulting from superfluous tissue'. However, he considers that plexiform angioma may be classed with Albrecht's hamartoma. Payling Wright⁵ maintains that the border between malformations and tumours is nowhere more ill-defined than with the abnormalities of the smaller blood vessels. The large majority of the so-called haemangiomas are really hamartomas. Cater⁶ and Willis⁷ agree that a number of malformations of blood vessels lie in this no-man's-land between obvious errors of development and benign tumours. They lump together hamartomas, capillary haemangiomas, telangiectasia, and even pigmented moles. Moore⁸ refers to hamartomatous haemangiomas. These occur when a small mass of vascular tissue is misplaced or distorted and will grow with the growth of the body and so become evident. Because of the stagnation of blood, trauma or other factors, new vessels may form and enlarge the total mass more rapidly than the body as a whole grows. Our case could possibly be classed in this category.

Calcification of a thrombus in haemangiomas constitutes a valuable diagnostic sign and Khoo⁹ in his series found it to occur in 2.3% of cases. He described 4 cases of haemangioma in the neck in which phleboliths were demonstrated on X-ray examination. Khoo states that in angiomas the radiological appearances of phleboliths in typical cases is characteristic, viz. a homogeneous central shadow surrounded by concentric rings of opacity and translucency. However, in the differential diagnosis the following conditions must be considered: calcified parasites, haematoma, granuloma or any small tumour of the skin, osteoma, neuroma, myositis ossificans and calcinosis. When a deep-seated mass of the nature of an angioma is present a radiograph should be taken, for a diagnosis can scarcely be made for certain on clinical grounds alone. This is shown in a case described by Schwartz and Salz,¹⁰ where a mass in the masseter muscle was unsuccessfully

treated by radiation therapy until an X-ray of the neck demonstrated phleboliths and thus indicated the probable diagnosis of a cavernous haemangioma. At the subsequent operation the diagnosis was confirmed and the mass removed. The authors stress that earlier radiological examination would have avoided repeated, ineffective and possibly harmful course of radiation therapy.

As the true nature of hamartomata is not understood it is not surprising that the question whether they can acquire malignant properties is a debatable one. Moore⁸ considers that they may occasionally do so, but Willis⁷ states that they have no progressive powers of growth and remain unchanged for the remainder of life unless accidents such as trauma, thrombosis or haemorrhage take place in them. Kerley,¹¹ referring to hamartomata of the lungs, suggests that as their potentiality for malignant change is unknown in our present state of knowledge, they should be removed.

SUMMARY

A case of hamartoma of the neck is described and the relationship between hamartomata and the haemangiomas is discussed. The value of an X-ray examination in deep-seated masses of this type is stressed.

I should like to thank Mr. L. Stein for allowing me access to the case notes on this patient, who was under his care, and also the Superintendent of Baragwanath Hospital for permission to publish this case.

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CORNEAL FOREIGN BODY

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This survey was restricted to 500 cases of corneal foreign body suffered by patients while they were performing some industrial duty and who knew the time of occurrence and the work being performed at that time. Apart from these provisos the cases were unselected and were consecutive first attendances. The author handled almost all these cases in the first instance and so all arbitrary assessments were uniformly made and the technique used in each case was the same.

Treatment. The treatment routine was as follows: After the diagnosis was made, local anaesthetic drops (Pantocaine

0.5% with Adrenalin 1 : 1,000) were instilled and the surgeon removed the foreign body with the sharp and cutting edge of a Saunderson's needle (which is kept sterile in Lysol and rinsed in sterile cold water). If possible, all the surrounding rust stain (or as much as was feasible) was removed at the first attendance. Occasionally an obstinate rust ring was removed with an 0.25 mm. dental burr, used as a trephine. The patient lay prone on the table, staring straight forward with both eyes open. Whilst a binocular loupe was worn, the eyelids were kept open by the surgeon, who at the same time could steady the globe by digital pressure. Good

illumination was provided by a strong handlamp held by a nurse. After removal of the foreign body, mydriatic drops (Homatropine 2% and cocaine 2%) were instilled and Albucid eye-ointment (sulphacetamide 6% or 10%) applied, and a firm pad was bandaged on. In 50 cases Polyfax eye-ointment (polymyxin + bacitracin) was substituted for sulphacetamide as part of another investigation. No different trend in results was noted.

The eye was examined the next day, though when the eye was comfortable the patient invariably failed to return. Patients were instructed to keep their eye closed under the pad (omission of this frequently leads in a few hours to a return visit of the patient with a pad abrasion of the cornea). If a longer convalescence was anticipated or carbolicization of the wound was required 0.5% hyoscine drops or 1% atropine drops, depending on the period anticipated, were instilled. The pupil was kept fully dilated and the eye covered, together with suitable antibacterial therapy, for as long as the corneal epithelium remained unhealed. If there was any suggestion of wound infection then pure carbolic acid was applied on the end of an orange-stick point to the dried anaesthetized corneal site. Where indicated (by persistent infection or deep or extensive corneal wounds, possibly with involvement of the anterior chamber) crystalline penicillin (250,000-500,000 units) in 0.5 c.c. of sterile saline, containing 5 minims of Mydracaine (which contains atropine, adrenalin and cocaine) was injected subconjunctivally and repeated as necessary.

All the cases had the eye covered by pad and bandage for some period. Two-thirds of all cases were covered for 2 days or less and of the remainder, $\frac{1}{3}$ of the total series were padded for 3-5 days. More than half the cases paid three or more visits to the hospital, whilst just over half were off duty for three days or less. Apart from the mechanical delay in healing related to the extent of the wound to be covered, the depth and size of the foreign body had no bearing on the period the eye was covered.

Occupation. The occupations of the patients covered a wide sweep of the industrial field, light industry predominating. Machine operators working on iron and steel comprised almost 70% of those attending (Table I). As

TABLE I, II AND III. OCCUPATION AND WORK IN PROGRESS

| I. Occupation | | II. Work in Progress | | III. Work in Progress | |
|---------------|----------|----------------------|----------|-----------------------|----------|
| No. | % | No. | % | No. | % |
| Machinists | 348 69.6 | Grinding | 234 46.8 | Normal | 477 95.4 |
| Labourers | 37 7.4 | Machining | 142 28.4 | Unusual | 23 4.6 |
| Others | 115 23.0 | Hammering | 70 14.0 | | |
| | | Other | 54 10.8 | | |

would be expected, 71% were in the 20-40 years age-group. The same number was above this age group as below. Almost one half of the cases were grinding metal at the time of the injury (Table II). Of the 500 accidents, in only 23 cases were the workmen doing a job which they normally did not perform (Table III).

Protective Devices. Each patient was questioned whether glasses or goggles or any other protective device was being worn at the time of the incident; if such devices were being worn, how the injury resulted; if not, whether safety devices were readily available or why they were not worn. All comments were noted. In the 500 cases, 23 men were wearing glasses without over-covering goggles—they felt that glasses gave sufficient protection; and 36 men stated that they were wearing goggles at the time—of these, 28 maintained

that the goggles were defective, with gaps at the nose-pieces or side-pieces or through the ventilation holes or the wide wire-mesh. In the large group not wearing any protection (440 or 88%) only 191 men gave some reason for not using the safety measures provided: 76 claimed that such devices were unnecessary for the job in hand (despite the fact that an injury resulted) and another 53 stated that, although goggles were provided, they were not thought necessary for their particular work. Most gave no reason for not wearing protection or else admitted to being too lazy. Only 37 stated that the goggles interfered with their vision, being dirty or scratched or broken or steamy and thus inadequate for precision work.

Just over half the patients had previously had foreign bodies in their eyes, whilst almost 3 in 10 had previously had them on more than one occasion.

First Aid. Half of those attending had been given no first-aid treatment; 73% of these were off duty for 4 days or less and 27% were off for 5 or more days. Of those

TABLE IV. TIME OFF DUTY IN RELATION TO FIRST AID

| | First Aid | | No First Aid | |
|----------------|-----------|-----|--------------|------|
| | No. | % | No. | % |
| 4 days or less | 155 | 62 | 187 | 73.6 |
| 5-7 days | 45 | 19 | 25 | 9.9 |
| 8 days or more | 46 | 19 | 42 | 16.5 |
| Infected cases | 18 | 7.3 | 24 | 9.1 |

who had had preliminary treatment 62% were in the group 4 days or less, and 38% fell in the group 5 days or more (Table IV). The cases which required treatment for secondary infection were almost equally distributed between the first-aid and non-first-aid groups.

Delayed Treatment. Delay before attendance was found to have definite lengthening effect on the duration of convalescence (Table V). In the group off duty for 4 days or less, 76% attended on the same day as the injury or the day after, and 3.5% delayed 5 days or longer before attending. In the group off duty 8 days or more, only 66.6% attended on the same day as the injury or the day after, and 10.5%

TABLE V. DELAY IN TREATMENT IN RELATION TO TIME OFF DUTY

| Delay (days) | No. | % in 'days-off' group | % in 'delay' group | % of all cases |
|--------------------------|-----|-----------------------|--------------------|----------------|
| (Off for 4 days or less) | | | | |
| 1-2 | 258 | 75.9 | 70.3 | 51.8 |
| 2-4 | 70 | 20.6 | 64.2 | 14.0 |
| 5 or more | 12 | 3.5 | 50.0 | 2.6 |
| (Off for 5-7 days) | | | | |
| 1-2 | 65 | 69.1 | 17.7 | 13.0 |
| 2-4 | 24 | 25.5 | 22.0 | 4.8 |
| 5 or more | 5 | 5.4 | 20.8 | 1.0 |
| (Off for 8 days or more) | | | | |
| 1-2 | 44 | 66.6 | 12.0 | 8.8 |
| 2-4 | 15 | 22.8 | 13.8 | 3.0 |
| 5 or more | 7 | 10.6 | 29.2 | 1.2 |

waited 5 days or longer before attending. Conversely 70% of the same-day or next-day attenders were off duty for 4 days or less and 12% for 8 days or more; whereas, in the group which delayed 5 days or longer, 50% returned

to duty in 4 days or less, and 30% in 8 days or more. In the group delaying 5 days or more, of those who were off duty 8 days or more 16.6% were infected cases as compared with 12.6% non-infected.

Left and right eyes were found to be equally affected.

In 2/3rds of the cases the corneal foreign body was small or superficial, whilst only 58 were large and deep.

Rust Staining. Just over half the cases had rust-staining surrounding the wound. Table VI exhibits the differences in the period the injured eye was covered and in the off-duty

TABLE VI. SHOWING EFFECT OF INFECTION AND OF RUST STAINING ON THE TIME THE EYE WAS COVERED AND ON THE TIME OFF DUTY

| | <i>Infected</i> | <i>Non-infected</i> | | <i>All cases</i> |
|-------------------|-----------------|---------------------|-------------|------------------|
| | % | <i>Non-rust</i> | <i>Rust</i> | % |
| | % | % | % | % |
| <i>Covered</i> | | | | |
| 2 days or less .. | 7.1 | 81.0 | 60.2 | 67.2 |
| 3-5 days .. | 40.5 | 16.3 | 34.0 | 25.8 |
| 6 days or more .. | 52.4 | 2.7 | 5.8 | 7.0 |
| <i>Off duty</i> | | | | |
| 3 days or less .. | 0.0 | 72.7 | 48.9 | 56.8 |
| 4-7 days .. | 11.9 | 22.7 | 39.7 | 30.0 |
| 8 days or more .. | 88.1 | 4.6 | 11.4 | 13.2 |

period in those with rust rings and those without. Both criteria showed that the presence of a rust ring had a markedly delaying effect on the healing of the corneal epithelium. The 42 cases of secondary infection have been excluded in this comparison. Had they been added to the other 458 cases, they would have increased the bias, for 83% of the infected cases had rust rings.

Infection. Of the 42 cases treated for infection, in only 9 was there activity in the anterior chamber. In no case did hypopyon ulcer develop. In the 42 infected cases the period

TABLE VII. INFECTED CASES (42), BY COVERING TIME AND TIME OFF DUTY

| Covered (days) | | No. | Off duty (days) | | No. |
|----------------|----|-----|-----------------|----|-----|
| 2-4 .. | .. | 16 | 4 .. | .. | 1 |
| 5-8 .. | .. | 20 | 6-8 .. | .. | 17 |
| 9-12 .. | .. | 5 | 9-12 .. | .. | 11 |
| 15 .. | .. | 1 | 14-15 .. | .. | 8 |
| | | | 20-23 .. | .. | 4 |
| | | | 30 .. | .. | 1 |

of covering of the eye (Table VII) ranged from 2 to 15 days; patients were off duty for 1-3 weeks; 1 patient was off work for 1 month. In all these cases, the wounds were carbolyzed at least once and only local anti-bacterial therapy was employed.

DISCUSSION

1. These consecutive industrial cases of foreign body in the cornea treated at the senior eye hospital in London, received

the routine treatment which has been found to be the most efficacious in this type of case; viz. removal of the foreign body, and as much surrounding rust stain as was reasonable, with a sharp pointed instrument, the instillation of mydriatic drops (homatropine 2% and cocaine 2%), the application of Albucid eye-ointment (sulphacetamide 6% or 10%) and padding of the eye until the corneal epithelium had healed. Carbolyzation of the wound at the first sign of infection (haziness of the wound edges and slight greying of the surrounding cornea) was most useful in shortening convalescence.

2. It is noted that half the men injured were using a grindstone and that 95% were doing their usual work. Only 7% were wearing protective goggles at the time of the accident. Very few had a valid reason for not wearing protection—laziness (innate or because of the short duration of the task to be performed) is always the problem to be tackled in any campaign for the prevention of accidents. No more than 6% complained of defective protective devices.

3. First-aid measures seem to have no effect on the results. Delay in attention definitely delays convalescence. Rust stain remaining in and around the wound markedly delays healing.

4. In no case did hypopyon ulcer develop, and in only 9 cases was there anterior chamber activity. This remarkable record was presumably due to the sterile removal of the foreign body, the immediate application of chemotherapy or antibiotics, and the early exhibition of more intensive anti-bacterial therapy when indicated. Whilst 26% of cases were off duty for a week or longer, 7% required more than 5 days for the wound to heal (Table VI).

5. The number of man-hours lost from production by this small but representative group of industrial workers emphasizes the huge waste resulting from easily preventable accidents.

SUMMARY

A report is offered on the origin, treatment and results of 500 cases of corneal foreign body sustained under known conditions.

The routine treatment which has been found to be most efficacious in a modern hospital is detailed. The value of immediate chemotherapeutic and antibiotic treatment is stressed.

The failure to use eye-protection devices, even when they are available, is noted, and the huge waste of man-hours which results from accidents thus caused is stressed.

I should like to express my thanks to the surgeons of Moorfields Eye Hospital, London, for their encouragement and their permission to report these findings.

UNION DEPARTMENT OF HEALTH BULLETIN

Union Department of Health Bulletin. Report for the 7 days ended 14 March 1957.

Plague, Smallpox: Nil.

Typhus Fever. One (1) European case in the town Bultfontein, O.F.S. Diagnosis based on clinical grounds only.

Epidemic Diseases in Other Countries.

Plague: Nil.

Cholera in Calcutta.

Smallpox in Kabul, Ahmedabad, Allahabad, Bombay, Calcutta, Cochin, Madras, Nagapattinam, Pondicherry, Tiruchirappalli, Visakhapatnam (India); Djakarta (Indonesia); Baghdad, Basra, Mosul (Iraq); Kuwait (Kuwait); Saigon-Cholon (Viet-Nam); Nairobi (Kenya).

Typhus Fever: Cairo, Damietta (Egypt).

DOMICILIARY TREATMENT OF TUBERCULOSIS OF BONE AND JOINT

J. J. COMMERELL, M.Ch. ORTH (L'POOL), F.R.C.S. (EDIN.)

Orthopaedic Department, Groote Schuur Hospital and Lady Michaelis Home, Cape Town

At the meeting of the South African Orthopaedic Association in Cape Town in 1953, I read a short paper¹ discussing the methods we were using to treat those cases of active tuberculosis of the spine, hip and knee, which could not be admitted to hospital because of the shortage of beds owing to the large number of cases.

Domiciliary treatment was thus imposed on us and, while I freely admit that treatment of tuberculosis today is much easier, shorter, and more open to active surgery, such surgery does require hospitalization, and when hospitalization is not possible some type of domiciliary treatment must perforce be used. In any case, tuberculosis of the spine is not so amenable to heroic surgical attack.

Until 1950 these cases were receiving the usual out-patient attention, namely plaster-of-Paris jackets and spicas, and the results were not at all satisfactory.

Because of the existence of our extramural clinic system, which employs 4 visiting orthopaedic sisters, we were able to make an attempt to give a full hospital course of treatment to each case at home. The basis of the local treatment of tuberculosis is still the treatment of the general disease, and in this type of practice, dealing with overcrowded houses, often with ten people living in one room, the basis of the treatment indicates that the patient should have his own comfortable, hygienic, movable bed, and for this purpose we have used the Thomas' frame. Streptomycin, Rimifon and PAS are also given, and when possible intra-articular streptomycin.

The first patient was treated at home on a frame in July 1950. In the 6 years up to July 1956 a total of 410 cases have been treated at home. Of this number, 376 have had tuberculosis of spine, hip and knee—the rest have had Perthes' disease, tuberculous ankles and shoulders, etc.

I will confine myself to reporting on the spines, hips and knees. All these 376 cases were given domiciliary treatment, often under terrible home conditions. Not all were on frames. The Thomas' bed-splint and ring-bottom caliper was used for knees. As hospital accommodation became available, those with really bad home conditions were transferred. Of the total of 376 so handled, I can quote the following figures:

260 were treated on the frames, the rest on Thomas' splints, plaster-of-Paris beds and casts.

4 died from various causes.

28 still showed active disease and these were treated on frames at home.

126 who started treatment at home were eventually admitted to hospital for various reasons, such as; not improving, very bad home conditions, parents getting divorced,

flooding, and, in two cases, because the children were attacked by rats.

No fewer than 218 patients were treated at home from the moment of diagnosis right through to being declared clinically and radiologically healed. Of these 218 cases, most were treated on frames, the average length of stay on the frame was 16 months for spines and 14 months for hips. Under conditions where domiciliary treatment is necessary, the Thomas' frame is to be recommended. It has proved itself to be far superior to any other method we have tried. It is relatively easy to use, as has been proved by the fact that the children are tended at home by their parents, and are only supervised by the orthopaedic sisters. The frame is modified by having a built-in stand to allow for easy bed-panning. We also use a short saddle so as to take away all pressure on the gastrocnemius, and to allow slight knee-movements. This prevents deformities of the feet and keeps the legs growing straight. Adults take some time to settle down, but they do extremely well on the frame. The oldest case so treated was 28 years old.

There still remains the need for long-term orthopaedic homes, as even with this successful domiciliary treatment, we were forced to admit 126 cases to hospital; but I would like to point out that these were admitted over a period of 6 years, i.e. only 20 per annum, and at present in Cape Town I can report that there are only 2 children with tuberculosis of the spine and hip urgently requiring admission to a home. Most of the beds are occupied by children from outlying districts.

It is of interest to note that in 1953 we had no fewer than 120 cases on frames at home—the equivalent of a rather large orthopaedic home—in July 1956 we have only 28. This is probably due to the fact that we have cleaned up the back-log, and also that, as diagnosis and treatment start earlier, treatment is more rapidly effective.

My personal impression is that children treated in reasonably normal homes appear to do better than those treated in an institution. The reason for this may be that while the treatment is exactly the same, the children at home are happily surrounded by their families and friends, and fed by home cooking, while in an institution the food is uniform, and I feel that this is a big factor, especially in a multi-racial society with very different social outlooks and habits. Admittedly they lose schooling, but when one considers that the time spent on a frame is averaged only 16 months, I doubt if this is an important factor. Those children that I see at follow-up clinics who have been discharged from orthopaedic homes appear to me to have a strangeness about them which is not detected in those who have been treated at home.

As far as economy is concerned, this speaks for itself, and I will not labour the point.

REFERENCE

1. Commerell, J. J. (1954): S. Afr. Med. J., 28, 234.

PROVOKING INTROSPECTION ON THE WORK OF THE MEDICAL ASSOCIATION

VALEDICTORY ADDRESS AT THE ANNUAL MEETING OF BORDER BRANCH IN EAST LONDON
ON 9 FEBRUARY, 1957

B. NAVID, M.B., Ch.B. (CAPE TOWN), D.M.R. (LOND.)

In casting around for a choice of subject for an address of this nature, an early temptation is to indulge in the popular pastime of tilting at one's colleagues—the old pounce on the young, the young on the old, and the editors of our journals are provided with a constant supply of material for their correspondence columns.



Dr. B. Navid

Having arrived at what is probably the half-way stage of my medical career, I do not qualify for inclusion in the ranks of either the young or the old so I shall attempt to provoke a little introspection on the part of the Medical Association of South Africa which embraces practically the whole profession, irrespective of age.

Thus we find that the Association is performing two functions fairly satisfactorily.

(1) *Clinical*: In the bigger centres, at least, a considerable amount of good clinical fare is provided at Association meetings. The standard of material published in our *Journal* has improved greatly in the last decade, and the

upward trend in quality continues.

Contributory factors to this are: (a) Expansion of post-graduate training facilities at our Universities; (b) Increased employment of keen, young, well-trained personnel in a full-time capacity at the Universities and Teaching Hospitals. Associated with this is a marked increase in research activities.

These trends and developments must of necessity improve the quality of our medical literature and academic fora and must likewise leave their mark on the standard of medical practice in this country. Great credit is due to our Senior Medical Schools for this—they have not been content to rest comfortably on the solid foundations laid by the eminent pioneers of medical education in South Africa, but have built and expanded enormously on those foundations. Credit is also due to the younger medical faculty at Pretoria for adopting the same policy.

As far as many of the smaller centres and country areas are concerned, clinical 'catering' falls far short of the ideal, and in some cases extreme famine conditions exist. The 'big brothers' of the profession in large towns could help to remedy this by regular visits comprising talks, symposia, etc., but the country practitioners themselves must of necessity stimulate their co-operation by a display of interest and by demonstrating that a demand for such activities exists.

(2) *Medico-Political*: Due largely to the devotion of a great deal of time, energy and effort, by a relatively small proportion of members of the Association (in some cases extending over many years) the Association functions as a fairly efficient Trade Union. The word 'fairly' is inserted advisedly, as in this department also there are many shortcomings, and one wonders whether some of these would not be remedied by taking a leaf out of the book of the legal profession's organisation, which has compulsory membership. It can hardly be said at present that the medical profession speaks with one voice; majority decisions are not binding, as individuals, who, if they happen to be members of the Association, can always resign in order to act autonomously. Needless to say, such autonomous action is often analogous to a malignant growth in that it frequently benefits the individual cells but harms the organism. Zonal antagonism is also hampering the smooth working of

the Association—as witness the proceedings at Federal Council meetings. As appeals for unity are almost invariably futile, I do not propose to make one here. One's faith is best pinned to the hope that sheer economic necessity will ultimately forge a solution to this problem and instil a measure of southern tolerance into some of the caustic critics within our ranks. Before leaving this subject, I would like to express the hope that the formulation of the Association's future policies will be based to an increasing degree on moral standards and principles, and to a rapidly decreasing extent on the dictates of vested interests. This might well be an extract from a speech about U.N.O.

POTENTIAL ACTIVITY NEGLECTED

As I have said, in the Clinical and Medico-Political spheres, the Association is doing a reasonably good job of work, but there is a third form of potential activity, which is being completely neglected, that is the role of 'National Physicians' or 'Physicians to the Nation'. This merits some explanation. It is the normal function of individual practitioners to attend individual patients and advise them on matters affecting their health. I suggest that it should also be the normal function of the Medical Profession as a whole to guide and advise the nation on health matters; to ferret out and combat failings and shortcomings in the Medical and Health Services of the country. 'Public Health' matters, in the narrower sense of the term relating to infectious diseases, etc., are being cared for by national, provincial, and local authorities and I do not refer to these.

POLIOMYELITIS VACCINE

A few examples will illustrate what I am getting at:

(1) *Poliomyelitis Vaccine*: This is a very topical subject and of great concern to all of us. The South African vaccine is obviously in short supply and none has so far been imported. Can we as a profession say that we have done everything in our power to remedy the situation, if in fact it is remediable? Are we in possession of adequate information on the subject, and if not, are we clamouring for it? Is it not an unquestionable obligation on the part of our Association to take the lead in this matter which each year so deeply disturbs the whole population. Are we fulfilling that obligation? I think not.

To my mind we have been unbelievably complacent. There has been virtually no correspondence in our journals on the subject. I am aware of no outcry from the profession for importation of vaccine or for reasons, if any, preventing its import. I understand now (but not through medical channels) that the Union Health Department is at long last going to import some. The obvious need for this step has apparently been overlooked for many months. A few individual branches (including our own) have pointed this out, but the Medical Association of South Africa, the national body, has failed in its duty and the public has been ill served.

While on the subject of poliomyelitis I would like to remind you that this Branch sent forward a resolution last year recommending that poliomyelitis teams be formed, consisting of experts who could be sent out to areas where serious epidemics existed. Their function would be to advise the local practitioners regarding treatment and handling of serious cases, particularly those with bulbar involvement. This resolution was, in fact, forwarded by the Head Office of our Association to the Union Health Department, which approved of the scheme in principle but listed numerous difficulties in its application. It is obvious that unless pressure is brought to bear on the authorities by the Medical Profession, this very sound suggestion, made originally by Dr. Eleanor MacIldowie, will come to naught.

SHORTAGE OF HOSPITAL BEDS

(2) *Shortage of Hospital Beds*: In every town and village of the Union one can hear the same complaint—insufficient hospital

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accommodation. We have heard the usual reasons and excuses *ad nauseum*—lack of funds, lack of nurses, etc., etc. I do not for one moment assert that these are not valid factors, but I do say that we, as a profession, are too easily lulled into quiescence by these replies from the authorities. I say it is our duty to keep stressing, and complaining about, inadequate hospital accommodation instead of, as we are inclined to do, shrugging our shoulders in time and unison with Directors of Hospital Services and such-like people in high places. This is yet another Medical Association function which is being neglected.

My immediate predecessor in this Office, Dr. Dudley Burton, mentioned this subject in his valedictory address, but as the situation has not exactly been remedied, perhaps he (and you) will pardon this bit of plagiarism on my part.

PARA-PRACTITIONERS OF MEDICINE

(3) A third example of Association shortcomings is our failure to conduct an energetic, not to mention successful, campaign against what one may call para-practitioners of medicine. I refer to that group of people which includes Cancer Curers, Nature Doctors, Faith Healers, Witch Doctors, etc. My phraseology in talking on this subject is of necessity stilted and restrained, as competent authorities have warned me that what I would really like to say is libellous and cannot be published. I am given to understand that even the use of the word 'quack' is libellous when applied to unqualified persons. Presumably only qualified mediceos can be called 'quacks' with impunity.

Suffice it to say that, in my opinion, and I assume that goes for most of us, these people are doing the public a great deal of harm; the law, in its present form, does not appear to be able to curb their activities and some modification is indicated. The medical profession is again guilty of inertia in this respect.

MEDICAL SERVICES FOR NATIVES

It would be a simple matter for me to produce examples by the dozen, but you will be pleased to hear that I intend giving you only one more. I must warn you, however, that I intend expanding somewhat on this one, as it is a problem which extends right to our doorstep and frequently obtrudes itself on our consciousness and consciences. I refer to Medical Services for Natives. Living and practising as we do, in East London, I shall confine my observations to this town, and the adjoining Native areas. I have little doubt that they are equally applicable to Native areas elsewhere in South Africa.

I have not conducted an exhaustive or detailed survey on the subject, but I have a little personal knowledge of it, and have been able to collect a number of relevant facts, thanks to the very kind co-operation of several colleagues, whose assistance is acknowledged with thanks. I do not propose to burden you with a mass of details, but a brief resumé of the position is necessary. The details are available to anyone who may be interested.

The Native Area under consideration comprises East Griqualand, Tembuland, Transkei and Pondoland. In these areas the Native population, according to the latest census figures, is 1,260,000. The European population is negligible in comparison (18,500). Serving this population are well under a hundred medical practitioners. There are 770 general hospital beds, 153 maternity beds and 622 tuberculosis beds. There is one Health Centre (at Umtata).

There are *no Specialists whatever* and most, if not all, cases requiring specialist services are referred to East London.

As I happen to be an honorary Radiologist at the Frere Hospital, I can tell you that in relation to the population, a very small number of cases from the Native Areas requiring radiotherapy or X-ray examination are in fact seen in East London, and those cases which are seen are almost invariably too advanced to benefit materially from specialist services. I attribute the small numbers referred mainly to three factors: (a) The administrative and practical difficulties involved in referring cases, most of whom are completely impecunious. (b) Practically no hospital beds are available and they cannot be booked in advance. (c) A course of radiotherapy often takes several weeks, and even if the patient is fit enough to be treated as an outpatient, very few are able to afford or find accommodation, or cope with the transport problem to and from the hospital.

East London, a town with 42,054 Natives and 45,701 Europeans, has only one General Hospital with 185 non-European and 271 European beds. Incidentally, the non-European outpatient attendance at Frere Hospital during 1956 was almost 71,000. Most of these patients were attended by three Resident Medical Officers or Internes, one of whom spent all his time in the Outpatients Department; the other two, mornings and afternoons respectively. There are also Outpatient Clinics run by the Municipality.

It is of interest to note that East London has 72 private Medical Practitioners, as opposed to a total of less than 100 in the Native Areas (comparative populations 96,000 and 1,278,000 respectively).

In all fairness, it must be pointed out that improvements are being effected in the medical services in the Native areas, in the form of additional hospital beds and expanding tuberculosis services which are being energetically handled. The establishment of a Non-European Medical School will also help. But in spite of our awareness of what is being done, and the knowledge of the difficulties presented by financial considerations, we, as a Profession, cannot shut our eyes to three essential facts: (i) A large proportion of our population is not getting adequate medical services; (ii) The steps being taken to remedy this position are inadequate; (iii) The Medical Association is taking no part whatever in publicizing the problem or in its solution.

I have directed most of my remarks hitherto at the Association in general, but I should like to get in just one remark addressed specifically to our Branch. There is no doubt that in the past the Border Branch has not functioned as a true regional forum of medical opinion and that, I must admit, applies at least as much (no doubt more) to my term of office as previously. I am convinced that we are now moving in the right direction. However, the voluntary suicide of the East London Division, in order to make way for an active Branch, and the projected division of the Branch into a Border Coastal Branch with Headquarters at East London, and a Border Inland Branch with headquarters at Queenstown, are both moves that pave the way to the formation of two healthy, active, robust branches. In this case, I submit the motto 'Eendracht Maak Macht', is not applicable.

In conclusion, I say again that our Association has no justification for complacency in any of its activities, and that many of its obligations to the nation are being completely shelved. May I express the hope that this address will stimulate a little constructive thought on the conduct of our affairs.

MEDICAL EDUCATION AND INTERNSHIPS*

T. B. McMURRAY, M.S. ORTH. (L'POOL), F.R.C.S.

Convenor, Committee to Enquire into Medical Education and Internships

In 1945 the Federal Council of the Medical Association of South Africa set up a committee to consider the present position of medical education in the Union of South Africa, and also the position of internships.

The convenor was the late Mr. M. Cole Rous, the Secretary

* Report submitted to Federal Council, Medical Association of South Africa, 27-29 March 1957.

Mr. T. B. McMurray, and other members Dr. J. Lee, Dr. J. Joubert, who was co-opted, and the following corresponding members: Dr. Struthers, Dr. Ziady and Dr. Segal (Transvaal), Dr. Taylor (Natal), and Dr. Theron and Dr. Visser (O.F.S.).

A preliminary report was issued in August 1955. Since that date the work has gone forward, and an increasing amount of information has been received.

There are in the Union 5 medical schools, viz. in the Cape

Province the Universities of Cape Town and Stellenbosch, in the Transvaal the Universities of Pretoria and the Witwatersrand, and in Natal the University of Natal at Durban.

The Universities of Cape Town and Witwatersrand cater both for White and non-White students. The Universities of Pretoria and Stellenbosch cater only for White students. The University of Natal caters only for non-European students.

The medical course takes 6 years in the Universities of Cape Town, Witwatersrand, Pretoria and Stellenbosch, and in the non-European University of Natal it takes 7 years.

UNDERGRADUATE SELECTION

Following the War years, there was a great increase in the number of students who entered the medical schools in South Africa. The applications came from (a) ex-members of the Armed Forces who had begun but not completed their medical studies when war began and who left to take part in the war, and (b) those who had not as yet begun medical training when war began, but who retracted to medicine after discharge from the service.

There was naturally a restriction on the number of places that could be allotted, depending on accommodation and facilities, and a first-class matriculation was made a *sine qua non* for the acceptance of any student for training in a medical school; in fact the student's whole academic history from high school, etc., was thoroughly investigated before his acceptance.

Recently, however, there has been a diminution in the number of applications, and this has given rise to some alarm in the Universities, which up to now have been able to pick and choose the type of student they desire, but are now experiencing a shortage of candidates. This reduction in the number of applications may be attributed to the fact that not only has the post-war rush ceased, but the expansion of the country's industrial and scientific interests has led young men and women to seek employment and advancement in other fields. Although it is quite understood that a first-class matriculation may be no criterion for selecting a successful and capable doctor, up to the present time no other method of screening has been used.

Attempts have been made overseas to select undergraduates for medicine by means of personal interviews, together with various psychological tests, but apparently no irrefutable data have been secured to show how successful these attempts have been. It is extremely doubtful if it is possible at the present stage of psychology to give a competent estimate whether a student will become a good doctor. Often the burning desire to undertake the arduous duties involved in medical practice arises only with experience. Probably the academic ground for exclusion from the medical course may be instrumental in keeping out candidates who might add lustre to the profession; as has been said many times before, the practice of medicine is not all science, but a great deal of it is art. For this reason, more study is necessary before a definite method of selection can be adopted.

Why do people wish to become doctors?

The reason has often been debated why a student has decided upon medicine as a career. Careful questioning of the student reveals several possibilities:

1. It is suggested to him by his parents, who wish to have a doctor in the family. The reason, however, is not always as sentimental as this. During periods of depression, a business man may realize that the outlook for his son in business is not secure. He feels that the profession of medicine, which is not subject to lack of work during economic depression, may be a safe haven for him in the future.

2. The burning belief (which is rare) that medicine is the only profession or occupation likely to prove satisfying. These are the people with the real mission for medicine. They take it up with courage and intensity during the first few years, and often it burns itself out during the later decades. Where, however, this burning zeal persists, it often gives rise to an able, conscientious, and even great doctor.

3. The position which a doctor holds in the community often gives rise to a feeling of hero worship in those around him. He appears as a respected member of the public, the confidant of many, the repository of secrets, the adviser on family and personal matters. This leads many of the younger generation to aspire to such a position, which is not occupied for profit alone, but

appears to be above and beyond the normal run of business and professional men.

4. Then there are those students who go into medicine because their families were always in medicine and it has always been presumed from early childhood that they would enter medicine as a profession. These form a surprisingly large group amongst medical students, and they have several advantages over the other groups. For instance, they have a definite idea what medicine is about. They know the trials and tribulations, the long hours and the difficulties that beset a doctor in practice. When they actually get into practice they do not expect anything better than what they get. There is little psychological trauma, since they are not really leaving home, but are merely transmuted from an observer to an active practitioner. They have little difficulty with medical ethics, because it has become second nature. Their acceptance of the problems of practice and its demands militates in favour of a happy life. In comparison with the other groups, there is no bewilderment of being called out at four in the morning on some trivial expedition, nor is there any difficulty in their finding their feet amongst the complexities of practice, for their feet were never really off the ground. They do not dramatize the medical degree. It is accepted as part and parcel of their life to be.

THE MEDICAL CURRICULUM

The medical curricula adopted by the Faculties of Medicine in the Universities of Cape Town, Witwatersrand, Pretoria, Durban and Stellenbosch are in accordance with the regulations of the Medical and Dental Council of South Africa, which is a statutory body controlling the qualifying examinations and registration. With minor variations, a typical example of this is the curriculum for the University of Cape Town for the first 3 years:

In the first year the study includes Zoology, Physics, Chemistry and Botany; in the second year, Anatomy and Physiology; in the third year, Pathology, Bacteriology, Pharmacology, Genetics, Medicine, Medical Psychology and Medical Sociology.

The hours are as follows:

| Subject | Year | Systematic Lectures | Supervised Practical Tutorial Clinical Hours | Total Hours |
|---|------|---------------------|--|-------------|
| Botany Special | 1st | 36 | 72 | 108 |
| Chemistry | 1st | 72 | 120 | 192 |
| Physics | 1st | 72 | 72 | 144 |
| Zoology | 1st | 72 | 72 | 144 |
| Anatomy | 2nd | 150 | 420 | 570 |
| Physiology | 2nd | 147 | 363 | 510 |
| Pathology with Bacteriology and Chemistry | 3rd | 192 | 376 | 568 |
| Pharmacology | 3rd | 57 | 22 | 79 |
| Psychological Medicine | 3rd | 16 | 24 | 40 |
| Medicine General | 3rd | 36 | — | 36 |
| Vaccination | 3rd | — | 6 | 6 |

First Three Years

The yearly accumulation of knowledge in the scientific field gradually increases the mass of information and detail that a student must retain in order to get through his professional examinations. For some years, the time devoted to pre-clinical tuition has been 3 years and, although this has been a fixed and rigid space of time, more and more has to be crammed into the courses provided, so that at the present time they are bulging at the seams.

There have been many suggestions how the medical courses should be pruned, but it is not the time to debate the advantages of Zoology over Botany, or to suggest complete removal of some of the basic sciences from the medical curriculum. There is considerable resistance to any change in the traditional medical course; nevertheless considerable changes must take place if the course is to remain one of 6 years. A study of the literature would seem to indicate that the two most important factors that

might impede the number of students available for the staff.

It is well-known of the public that it does, however, which is 'streamlined' old method traditional deal with a efficient as in observat This method as a process of the lectu through the is to be given the old met

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At present included in the principles of Bi subjects may since Zoology was at one t now surren subjects dep to elementa these subject Biology mi by the tuto such as the ments of Bo is a distinct importance were to tak either is to remain a pe pruning.

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Clinical Year

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might impede progress, are (1) a shortage of money, which limits the number of teachers and the amount of equipment and buildings available, and (2) the attitude and feelings of the teaching staff.

It is well-known that the lack of finance is a constant source of embarrassment to medical schools and hospitals in this country. The old method of teaching is the cheapest form and in the eyes of the public the standard of medicine seems to be maintained. It does, however, leave out the question of advance and improvement, which any modern body of lecturers must desire in order to 'streamline' and improve their own University course. The old method of teaching, which was based on the lecture in the traditional pattern, whereby a lecturer or professor could easily deal with a class of 80 or 120 students, has been found not so efficient as the small study groups of 4-6 students being trained in observation, inference and exposition by an individual tutor. This method far surpasses the lecture, which has been described as a process by which knowledge is transferred by the notebook of the lecturer to the notebook of the student without passing through the minds of either. It is clear that, if individual teaching is to be given to the students, it will require more teachers than the old method and will cost considerably more money.

Suggested Improvements

At present, the subjects of Zoology and Botany are both included in the medical course in order to introduce the basic principles of Biology to the medical student. While each of these subjects may have been originally necessary in its own sphere, since Zoology was an introduction to animal life and Botany was at one time the basis of Pharmacology (a position that it has now surrendered to Chemistry), the present usefulness of these subjects depends upon the facts that they introduce the students to elementary Biology. It is possible that the time spent on both these subjects could be shortened and, in fact, a course of general Biology might prove more effective, with illustrations drawn by the tutors from both Botany and Zoology. A suggestion such as this might cause considerable resentment in the departments of Botany and Zoology, since each may feel that its subject is a distinct entity, and would lose its individuality and its relative importance in the scheme of education if such a fusion of interests were to take place. It is, however, necessary to consider that if either is to survive in the medical course, and the course is to remain a period of 6 years, it will be necessary to do considerable pruning.

With regard to Physics and Chemistry, it is questionable whether some of the chemistry courses are eventually of value to the student of medicine. The period spent on analysis is of very limited value to the qualified doctor, and he might be taught the principles without wasting time in its practice. Physics and Physical Chemistry obviously form the basis of much Physiology, and it is suggested that the course of Physics could be combined with that of Physiology, the principles of light taught in conjunction with the Anatomy and Physiology of the eye, the principles of sound in conjunction with the Anatomy and Physiology of the ear, while heat and electricity could also be pruned to fit the medical curriculum. By careful adjustment of the time spent on these subjects a further saving of time in the medical course could be achieved. It should be noted that the subjects of Chemistry and Physics are already taught in pre-university education and it might be desirable for both these subjects to be included in the matriculation examination for the potential doctor, thereby obviating repetition in the first year of the medical course.

Resistance to Changes. The attitude and feelings of the teaching staff would obviously have to be considered in any proposed changes. It has been suggested that the greatest resistance would come from the professors and lecturers themselves, since the force of tradition would outweigh even the obvious necessity for improvement in modern methods. It has been suggested that the basic-science staffs in the medical course in view of the accelerating accumulation of modern knowledge, instead of pruning out what is obviously valueless to the potential medical practitioner have suggested that an increased amount of time should be allotted to their subject in an attempt to increase its academic importance.

Clinical Years

In the fourth, fifth and sixth years there may be minor variations in the amount of time spent on each subject, but generally the courses conform to Medical Council regulations, and are

exactly similar throughout the Universities of South Africa. Unfortunately for the medical student, as time passes, the amount of knowledge that is required of him increases, so that 6 years may very shortly become quite inadequate to accommodate all the student has to know.

The medical schools of South Africa, like schools elsewhere have been attempting to change their curricula in recent years, and discussions to that end have been carried out.

FAULTS OF THE MEDICAL CURRICULUM

The main faults of the medical curriculum would appear to be:

(a) *Overcrowding* of the time-table, which has an inhibiting effect on the mind of the student and leaves no time for thought.

(b) *Watertight Specialities.* The training in terms of fragments and facets of specializations by specialist teachers working in watertight compartments.

(c) *Departmentalized Instructions.* Teaching is administered in terms of subjects which are departmentalized from one another; they are taught as in pure culture. The reasons why a student should study the various subjects, and how they can be of use to him later when he is in practice, is at present left to his imagination, and there is little instruction concerning their practical application until he reaches the clinical years. Interest and devotion to study could be fostered if the surgeon, physician and pathologist took appropriate material into the departments of Anatomy and Physiology and taught in cooperation and harmony with the anatomist and physiologist; but this is not yet done. Under the traditional curriculum the subjects are taught individually and truncated by professional examinations. It would be ideal if, at an early stage in the student's course, the clinical application of the earlier subjects could be stressed so that the clinicians would have an opportunity of meeting students in their first year to show them how such subjects as Physics and Chemistry form the basis of much that they will meet later on and enable the student to pick out the essentials which will be of value to him as he progresses.

(d) *Inadequate training in the important aspects of general practice.* Up till now there has been no attempt to include the general practitioner amongst the teachers, and the student's mind is entirely orientated towards specialist practice; in fact, each specialist apparently believes that the student must have a sound grounding in his special subject—even in the most elaborate techniques—before he can be permitted to practice medicine.

(e) *Instruction by Specialists.* The type of teaching accorded to the students is entirely by specialists who tend, as time goes on, to become ever more specialized. The emphasis has been on knowledge, detail and memory, rather than on general principles and the logical approach to a problem. An attempt has been made so far to produce a repetitive text-book of Medicine and Surgery, rather than a mature and logical practitioner. The following methods have been suggested for training the student in General Practice.

(i) *Student Clinics* have been started in the Universities of Witwatersrand and Cape Town where, with the minimum of supervision, the medical students see patients who come to them direct from the poorer districts. These cases, if necessary, are referred to the out-patient clinics of the University hospital. The student thus gains experience in handling and managing the personal problems of patients.

(ii) *Apprenticeship.* It has been suggested that it would be an advantage for the students to spend part of their time in the company of general practitioners who would demonstrate their methods of dealing with problems in domiciliary practice. Unfortunately, there is not a very great response from general practitioners and so far this method has not been given a trial.

(iii) *General Practitioners in the Hospital.* It has been suggested that general practitioners of sufficient experience should be invited to help in the casualty departments of the teaching hospital, where they would demonstrate their methods of diagnosis and management to final-year students. While this matter has been given considerable thought, it has not yet been tried. It offers several advantages: (1) The student would gain experi-

ence by seeing competent general practitioners at work; (2) the general practitioners would gain advantage from contacts with the teaching hospital, and (3) the members of the teaching staffs would derive benefit from discussion with general practitioners who are in the habit of handling family problems.

(f) *Attitude towards the student of the Teaching Staff and the Nursing Staff.* The teaching staff may be divided into several types:

(1) The practitioner who becomes attached to a University so that he may either build his ego by addressing students or increase his private practice by becoming known to the future generations of general practitioners. His attitude towards the student appears to demonstrate his own cleverness and facility, either with the knife or in the diagnostic field, and he uses his teaching time in order to advertise himself and teach the students to diagnose those conditions which he can best and most easily treat. The main object of his teaching is that students shall learn the most suitable specialist to whom to send their patients. Attentive admiration, silence and docile compliance have been the hall-marks of the model medical student to this type of teacher.

(2) The type of teacher whose approach signifies that we are all humble students of science. His employment is often in a full-time capacity and each patient is regarded as a case on which to work up a scientific paper or thesis. His approach to Medicine is unfortunate, in so far as he is unable to teach the humanities, nor has he the ability to instil confidence in the patient or the students except from a scientific aspect. He is apparently out of touch with everyday conditions of life, and because of this is unable to demonstrate medicine as an art, closely attached to the understanding of a human being. He appears rather as a lecturer of science, divorced from his laboratory and appearing absent-mindedly in the wards of a hospital.

(3) Probably the best type of University teacher in clinical subjects is one with wide experience, including a period of general practice and of private specialist practice, so that he can with confidence review the scientific, humanitarian and sociological aspects of the individual case. By this means, the student can gain the over-all picture of medicine as it exists today.

Often the attitude of the *nursing staff* towards medical students in the wards has been rugged and outspoken. It has been said that in those hospitals where the teaching of nurses is well carried out the teaching of medical students has to suffer. The apparent matriarchal contempt of elderly sisters has done much to discourage medical students from attendance in the wards; her starchy scorn has made them feel that they enter her domain only on extreme sufferance.

There was, 10 or 15 years ago, a definite place for the student in the ward, not merely as an observer and a hanger-on. Certain duties, such as the preparation of male patients, catheterizations and dressings, were done by students as part of their routine duties during their period of ward study. In recent years, however, either through the increase in numbers of medical students or from the fact that the nursing staff have taken more and more upon themselves in the way of treatment, the student is being gradually ousted from his position as ward clerk or dresser, and these duties have been taken over by the nursing staff. The student's position is one of observer, not well tolerated by the nursing staff, who look upon themselves as the workers, and the students as idle drones.

If the old system were restored and the student were definitely a surgical dresser, an increased practical knowledge of the work carried out in the wards might result. The spirit of cooperation, in which the more experienced sisters instructed the students in the art of dressings, the removal of stitches, etc., would make for better training and greater efficiency.

NON-WHITE MEDICAL STUDENT

The training of the Native, Indian, Cape Coloured and Asiatic medical students are catered for by the medical schools of Cape Town, Witwatersrand and Durban.

The normal intake at Cape Town is about 137 students, with an average qualification of 99 at the end of 6 years. The average number of non-White students qualifying is 6.

In the University of Witwatersrand, where there is an annual quota of 8 non-White students admitted to the first year, and

12 to the second year, admission to subsequent years is by merit only. The criterion for selection in the first year is that the student may have already completed one year of a university course successfully, and this may have been completed in the University of Witwatersrand or the University of Fort Hare, which is entirely confined to non-European students. Like the University of Natal, the University of Witwatersrand accepts Native, Coloured and Asiatic (including Chinese) students.

At Durban (University of Natal) where only non-White students are catered for, the normal intake is 40 places per year.

Selection of Students. There is no differentiation in the selection of students between the White and non-White. A first-class matriculation is required for entrance to the University and in Cape Town University there is no quota system that provides particularly for the reception of the non-White student. Selection is entirely on merit, and the same standards are maintained throughout.

Curriculum. The same curriculum is used for White and non-White students in Cape Town and Witwatersrand, the only difference being that some White patients object to being examined by non-White students and, consequently, non-White students are excluded from those clinics which deal only with White patients. Since most of the hospital patients, particularly out-patients, are non-White, this does not materially affect the training of the non-White student.

In Durban, which caters for non-White students only, the students include African, Coloured, Indian and other Asiatics. In addition to the normal curriculum, because some of the students have difficulty in understanding the medical course it has been found necessary to include a further year of study. This part of the curriculum is carried out before the normal first year, and consists largely of languages and the humanities. The subjects taken are English, Afrikaans and Netherlands, History, Botany, Chemistry, Physics, Zoology and Sociology or its equivalent.

Results. On the basis of examination results and making allowances for differences in language, the non-White students compare favourably with the White students.

Numbers of Non-White Students

Recently, however, there has been some difficulty in the University of Natal in getting suitable non-White students. Amongst the Natives, who form the mass of the population, there does not seem to be any particular keenness to enter the profession of medicine.

In discussion with social workers, it is revealed that the Native matriculant does not feel that there is a place for him in the practice of medicine amongst his own people, for it is only recently that the Native people have come to accept orthodox medicine as an integral part of their lives. To a large extent the Native population is still faithful to the ministrations of the witch-doctor. Many illnesses are attributed to the work of evil spirits, and cures are sought by the use of Native medicines with incantations and spells. Most of the Native patients and their families divide conditions of sickness into Native diseases and White man's diseases; while a Native may feel that the White man is competent to cure anything that can be classed as a White man's disease, he feels also that there are certain conditions that can only be cured by the witch-doctor. He believes that there are conditions which are beyond the comprehension, knowledge and experience of the White doctor. For this reason the Native doctor trained by the White man is suspect.

Secondly, there is a distinct economic factor that militates against the Native undertaking the profession of medicine. By far the large majority of Natives are in the lower income group and because the White man has provided free hospitals throughout the country, the attitude of the average Native towards medicine has become pauperized in so far that he takes the service of the doctor for granted and, therefore, is often, except for the provision of certificates of unfitness for work, unwilling to consider payment for the service received. The Native matriculant or potential medical student, knows that it is not certain that he will be able to provide himself and his family with a secure income from his own people, because he would be unable to compete with the free institutions; moreover, if his patients were willing to pay a fee, it would be too small to be sufficient financial reward for his long years of study.

Thirdly, although there are quite a large number of scholar-

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ships, and financial assistance is available to potential Native doctors, it is still a considerable financial burden to those in the lower income group to provide subsistence for themselves during their medical course. They well realize that the course is long and arduous, and that the strain of living during the period of studentship may make things so difficult that the maintenance of the altered and unusual standard of living may prove too much.

The question has often been asked what happens to the Native doctor after he leaves the medical school and has completed his internship year. It has been suggested by many observers, including missionaries, that there is a tendency for the type of practice to decline and revert to tribal practices and cults. Moreover their education is finished on qualification since rarely do they attend medical meetings or discussions. The reason for this is not hard to see. Usually they are isolated and in communities who lack education and culture; and their social contacts are meagre since their training has set them apart from their fellow men.

Secondly, the Natives who are their patients expect from a Native doctor something more than the mere practice of medicine. They believe wholeheartedly in witchcraft, and it is suggested that a mixture of medicine and witchcraft has on occasions been practised by Native doctors. It is difficult to see how this state of affairs might be avoided. It has, however, been suggested that a scheme should be evolved whereby Native doctors after a period of 3 or 4 years in practice should be asked to return to the Universities or teaching hospitals for a further training period, and that this might be repeated at intervals throughout their professional life. This training period would give them (a) further experience and guidance from the teachers of medicine, and (b) a contact with a type of practice differing largely from their own, which would be of considerable value to them, from the point of view both of medical knowledge and ethical experience. (c) It would also help the rest of the profession to understand the problem of medicine as practised amongst the Native people in their own surroundings.

THE INTERNSHIP PROBLEM

In conformity with trends throughout the world, the South African Medical Council put forward proposals in 1949 (later becoming law) which provided that a period of one year's compulsory internship should follow graduation. At that time there were a very large number of graduates in addition to the normal quota. Many were ex-servicemen who had not been able to complete their training before going into the services, and had latterly returned to finish their medical studies and graduate.

Because of this, an increased number of intern posts were created throughout the country to fulfil the needs of these graduates. Within a few years, however, the number of qualified doctors coming from the medical schools receded to normal, and in recent years, many of the posts have remained unfilled. Complaints have been received from hospital staffs throughout the country that they have had no applications for the intern posts in their hospitals and, consequently, considerable strain had been thrown upon the practitioners serving on the staffs of those hospitals, particularly in the out-patient and casualty departments.

Hospital staffs have regarded the intern not merely as a supernumerary student attached for educational purposes, but rather as a pair of hands or an assistant doctor, to carry out the chores of hospital practice and, particularly, to get up at night to attend emergencies. They have felt resentful because there has been no intern to fulfil these duties, and they have had an increasing amount of work thrust upon their own shoulders. Before 1949 this work had been ably carried out by local practitioners, but since the internship rules were promulgated and the luxury of a hospital assistant became apparent, the local practitioners have little intention of doing without this additional help.

Present figures show that there are about 120 vacant intern posts in the country. There are only about 300 new graduates per year, and it is likely that the figure of vacant posts will increase, since the number of graduates coming from the established medical schools and the expected number that will graduate from the two new medical faculties of the Universities of Natal and Stellenbosch are unlikely to keep pace with the posts created in an ever-increasing number of hospitals.

Medical Council has not really made it clear whether they regard the intern post as primarily an educational one, or whether they regard the intern as part of a labour force. If the post is an educational one, then the fact that there are too many internship posts in the country does not give rise for alarm but if, on the other hand,

the Provincial authorities regard the interns as a working force, then their demand is most unlikely to be satisfied, and they must look elsewhere for medical labour.

The only solution is that more higher-grade posts should be created, particularly in the smaller hospitals, where graduates who have completed their internship training can be employed at better salaries and under better conditions than at present pertain to the intern posts. It is suggested that, in addition to increased emoluments, they could gain some recognition for clinical work carried out. This might entitle them to sit for higher degrees, or a part of the time spent might count towards the period that a graduate may have to serve in order to get on the specialist register. If this were agreed to by Medical Council, the demand for hospital officers might easily be satisfied, since there are a number of graduates who have completed their internship period and are not yet ready to go into general practice.

The Type of Intern Post

In the teaching hospitals, interns are employed in the departments of medicine, surgery and obstetrics and gynaecology, as well as the special departments of dermatology, ear, nose and throat, eyes, etc. It is probable that the graduate who is going into general practice derives the most value from the subjects of medicine, surgery, obstetrics and gynaecology, and, in addition, paediatrics. The specialist posts have little to offer the newly graduated doctor in comparison with these four major subjects, and it is felt that the posts recognised for internship training in the teaching hospitals should be confined to the major subjects. In the grade-II hospitals, i.e. hospitals which have full specialist staffs, and yet general practitioners in addition on the staff, the interns are, in the majority of cases, not confined to any particular department, and constantly get a better opportunity to see medicine as a whole and deal with a wider variety of cases. It is possible that these hospitals offer a sounder basic training for the potential general practitioner than the teaching schools. For this reason it is felt that in the grade-II hospitals, there should be no restriction in the employment of interns.

Inspector of Interns

Originally, the Medical Council, with the help of finance received from the central Government, employed an Inspector of Interns to travel round the country, interviewing hospital superintendents and hospital staff, to see that all interns were getting proper instruction and carrying out their duties satisfactorily. After 3 years the Government's support was discontinued and, consequently, there has been no Inspector of Interns since 1952. Attempts have been made to resuscitate this post, but to no avail. While individual members of the Medical Council have expressed their willingness to inspect hospitals in their own time, no comprehensive routine inspection can be carried out in the present circumstances.

Some of the intern posts that are still on the list may be quite unsuitable for the training of the new graduate, and, while their abolition would certainly cause considerable misgiving in the minds of the local practitioners, it is necessary that the whole position should be carefully reviewed and brought up to date in view of modern requirements. In the outlying hospitals, where there is little active medicine or surgery carried out, and where the intern is required merely to stand in for the local practitioners with non-paying cases, and is responsible to a large extent for the casualty work without supervision, the position should definitely be revised. If a pair of hands is necessary owing to the amount of work in the casualty department or other department of a hospital, and where in the opinion of the Medical Council, adequate supervision and training is not available, then the posts should be upgraded and the emoluments increased so that graduates who have completed their internship year would be attracted.

The newly-formed College of Physicians and Surgeons of South Africa, will doubtless be formulating its regulations for those who wish to take its postgraduate examination. Undoubtedly, one of the requirements will be that the candidate must be employed in a recognized hospital for a stipulated period. Consideration will have to be given to the larger hospitals, where a considerable amount of clinical work is being carried out and recognition may be accorded.

At present there is a dearth of posts suitable for the graduate who has been qualified one or two years, but is not yet ready to practise on his own. The number of postgraduate posts in Cape Town, Witwatersrand and Pretoria is very small, and consequently

there is keen competition for all those posts, e.g., there are only 3 surgical posts in the Groote Schuur Hospital, Cape Town, that entitle the graduate to sit for higher degrees.

The College of Physicians and Surgeons of South Africa will obviously have to recognize additional posts throughout the country. Not all the smaller hospitals could be recognized for postgraduate work, since their facilities are inadequate, but the larger ones might easily be recognized, and this would provide additional training facilities for the postgraduate, and labour force on which the Province could rely.

TRAINING OF THE GENERAL PRACTITIONER

The education of the general practitioner in South Africa has not been considered to be a life-long process. Once he has completed his internship year, he has apparently absorbed all that medicine can offer and, until recent times, there has been no attempt to give him further instruction or encouragement. Present methods by which he can secure knowledge of recent advances are:

1. Journals

Through the *South African Medical Journal* and other local medical journals. The articles in this journal and others are on the whole contributed locally and concerned with recent original work. There have been attempts to run refresher courses in these journals with articles of general-practitioner interests, but they have not been maintained, and such articles have only appeared spasmodically.

2. Meetings

To medical meetings run by the Branches or Divisions of the Medical Association, where either local or visiting practitioners speak on their chosen subjects to the interest of their colleagues. The choice of these lecturers has been rather arbitrary. The names have been selected from those members of the Branches who have offered at the beginning of a session to give a lecture, or occasionally from visitors from overseas. The lectures are given usually in the 5 main centres of the Union—Cape Town, Johannesburg, Pretoria, Durban and Port Elizabeth. A large number of the practitioners of the Union practice in the rural areas, and they have little or no opportunity of attending these lectures. Some of the Branches have occasionally, in the past, sent teams of lecturers to places in rural areas where there is a sufficient medical population, thereby attempting to give the rural practitioners a bottled postgraduate course, usually lasting one evening. Unfortunately, even though the scope of these meetings is limited, the attempts to hold them have not been frequent, nor has this system been maintained throughout the country, so that its coverage is small. Attempts to provide an over-all picture of some condition have been made by means of symposia, which are particularly popular in the Cape area, in which a number of lecturers present their views on a subject with the object of providing for the practitioner a balanced view of a particular aspect of medicine. These have been very well attended but have apparently only been organized once or at the most twice in a year. It is felt that further planning would be necessary to provide a comprehensive review of modern medicine for the general practitioner and, when the programme of these symposia is considered, the general practitioner's interests should be paramount.

3. Refresher Courses

The Universities of Cape Town, Witwatersrand and Pretoria, have of late been giving refresher courses for general practitioners in various subjects. These have been of two types, viz. (a) in which the practitioner has to give up his work for a few days to attend an intensive course given by the University, and (b) a course primarily designed for local practitioners, the lectures being given in the evenings and covering several weeks.

Obviously, these two types of course must persist, since the practitioners in the country areas who are desirous of taking the course would rather have it condensed to cover a few days so as to interfere as little as possible with their practices; while local practitioners prefer the evening course and can still carry on as long as it does not interfere with their normal working day.

Up to now, these courses have been reasonably attended although in some instances, the number of places allotted have not been filled. It has been suggested that the courses should have been given considerably more advertisement or, secondly, that they should

have been run frequently enough to enable practitioners in partnership to attend serially and thus avoid interference with their practices.

The material of the course should be scrutinized with the greatest care with regard both to the lecturers and the choice of material, if the general practitioner is to receive adequate help for the time expended. The lecture should be well prepared and should be illustrated with clinical cases, films or slides, for far greater benefit and interest will accrue from lectures that are adequately illustrated. The lecturers should be chosen for their ability rather than for the fact that they may be the most senior specialists in a particular line. The courses should not be regarded by the specialist as an opportunity for personal advertisement nor should they attempt to put over their own personal ability. On the other hand, they should concentrate on those particular skills and techniques which are likely to be of most value to the practitioner in his own practice, and on the diagnosis of those conditions which remain obscure from the general-practice angle.

It is apparent that, as yet, the Universities have only scratched the surface of the problem of postgraduate education for the general practitioner and, although they may be busily employed in the education of the undergraduate, their responsibilities are not at an end once he has received his degree and completed his internship.

The newly-formed College of Physicians and Surgeons of South Africa, have discussed the question of postgraduate education, and it has been suggested that, in areas where there are no universities, they should organize courses for postgraduate study in which the general practitioner may participate. This project is still in the exploratory stage, and the question of providing facilities for travel to the more distant centres of the Union has been discussed. It is felt that once the College gets under way this plan may come into effect and regular lectures may be organized. It has also been suggested that once sufficient funds are available to the College it could easily endow fellowships, so that the invested funds would provide sufficient money either to make tours of selected lecturers available in outlying areas, or to make provision for teams of lecturers to visit non-university centres.

General Practitioners in Hospitals

In the Union of South Africa, excluding the special hospitals, there are 3 main types of hospital.

1. The teaching hospital which employs specialists both on a full-time and visiting basis.

2. The hospital in the area of a large medical population where both specialists and general practitioners are employed on the staff in a visiting capacity.

3. Hospitals in the rural areas which are entirely staffed by general practitioners.

With the increasing number of specialists, more and more of the work in the second class of hospital has been taken over by the specialists, assisted by interns and house officers, the latter working in a full-time capacity. The general practitioners are being gradually confined to seeing patients in the casualty and out-patient departments, and if anything of a serious nature arises the house-surgeon in the first instance calls a specialist and the general practitioner does not get the opportunity of attendance.

Patients are admitted to both the first and second type of hospital on (1) a recommendation from a general practitioner, or (2) through the casualty department. Because of the increased number of specialists, fewer and fewer of the indigent patients admitted through the casualty department are seen by general practitioners. Gradually, the general practitioner has come to feel that his position on the staff is superfluous, and he ceases to take calls or to be available to see patients in the hospital, except for those that he admits from his own practice. This diminishes contact with the clinical material available and therefore seriously curtails his interests in advanced medical practice. Two suggestions have been made in order to relieve this problem:

1. The general practitioners are in rotation responsible for the casualty and out-patient departments of a hospital, in so far that they see all cases before admission and refer them to the appropriate specialist. Unfortunately, this system has not worked too well where it has been tried, because there is a tendency for busy general practitioners not to attend regularly, knowing well that their work will be carried on competently by the interns and senior house-staff.

2. The general practitioner is attached to a specialist unit, so

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that he may gain experience in a particular branch of medicine and, by rotation with the other specialties, increase his postgraduate knowledge. Unfortunately, this plan has not been appealed to the general practitioners and, so far, it has not been possible to implement it. The general practitioners feel that their position in hospitals having a specialist staff is becoming degraded and a diminishing number of applications have been received for general-practitioner posts when they become vacant. In fact, discussions with some of the practitioners who have applied for posts on these hospitals have shown that their only interest in being on the hospital is the feeling that they might more easily be able to secure beds for their own patients.

If the general practitioner is to cooperate in the hospital service in the larger centres, a plan will have to be found where the general practitioner is given a specific time per week, per fortnight or per month, for his attendance at the hospital. He must also be given congenial work to do which will keep his interest and advance his education. He must be made to feel that he is not supernumerary to the house officers, and that the function of the department to which he is attached would be seriously impaired by his non-attendance. Once he has a specific time on which to attend, then he can arrange his own work so as not to interfere with his hospital duties.

The Attitude of the Superintendents

Unfortunately, it is the view of many superintendents of hospitals that the medical service of a hospital can be just as well run by the full-time staff and a panel of visiting specialists who can be relied upon for regular attendance and cooperation, to the exclusion of the general practitioners. This is considered to be a bad thing for medicine from two points of view:

1. It would be a loss to medical practice if the general practitioner were excluded from hospitals, because the hospital tends to keep him in contact with his colleagues in the specialist fields so that he can discuss cases with them and thus maintain his interest and continued education. By integration of the general practitioners in the hospital service the confidence of the public and the confidence of the general practitioners in the hospital service would both improve.

2. The leavening influence of the general practitioner in the hospital service, with his close contact in the social problems of the patients, tends to humanize the hospital, so that it ceases to be an impersonal gargantuan machine doling out diagnosis and treatment and shooting the patients back into normal life.

The Outlying Hospitals

In the outlying hospitals, the staffs are composed entirely of general practitioners. The problem of the encroachment of specialist services has as yet not become apparent. The facilities in these hospitals are adequate for most of the advanced treatments, particularly surgery, and many of the practitioners in the outlying areas practice a high standard of surgery. Up to the present time, however, there have been no facilities for further training of these practitioners in the field of recent advances and, since they are cut off from the centres of learning at the Universities, they have in some cases not progressed with the advancement of medical science.

The newly-formed College of Physicians and Surgeons of South Africa will attempt to remedy this state of affairs by instituting courses of instruction and encouraging those practitioners who are interested in a particular line of study to take time off to undertake the necessary training and to secure a postgraduate diploma.

House Officers' Duties

Recently an experiment has been tried in Cape Town, where a general practitioner of some 15 years' standing decided to leave his practice on a holiday, and come to Cape Town to be attached to a hospital for duties which resembled those of a house surgeon or intern. He stayed for about 3 months and was able to see most branches of medical and surgical work, and to take part in the treatment as carried out by the specialist staffs. He felt that his stay had been of great benefit to him, for he practised in the country and had been out of touch with the more modern techniques for some long time.

From this the conclusion has been drawn that this method of education might be further explored and might particularly be employed in those practices where there are partners, so that a periodic stay in a medical centre under specialist tuition might be available in rotation.

IN MEMORIAM

ROBERT DOUGLAS OSLER, M.B., CH.B.

Robert Douglas Osler, whose death occurred in Cape Town on 25 March, was born in Riversdale, Cape, on 27 March 1891. Losing his father, who for 20 years had been magistrate at Riversdale, at the age of 10, young Osler's early days were not easy. He matriculated at Riversdale, and then after a short spell at Normal College, went teaching for a few years in the Transvaal.

At last, at the age of 21, he was able to achieve his ambition to study medicine and went to Edinburgh in 1912. He qualified in July 1917 and immediately joined up—he came out on a troopship and saw service as a Medical Officer with the South African Forces in East Africa, where he was mentioned in despatches.

After his return from active service, Dr. Osler did a couple of locums and had a short spell on the staff of the Somerset Hospital, before setting up in private practice at Piquetberg in 1920. When war came in 1939, he joined up again, but as a result of rigorous years of country practice and the after-effects of a prolonged bout of enteric fever, he could not achieve an A1 category. He was posted to the V.D. wards at Wynberg Military Hospital. There he remained until

After his release from full-time service he was granted specialist status as a Venereologist on the strength of his war-time experience, and joined Dr. F. W. F. Purcell in practice in Cape Town. He continued on the staff of Wynberg Military Hospital in a part-time capacity—a post he held up to the time of his death—and was for about 5 years on the Honorary Staff at Groote Schuur Hospital.

Early in 1950 he was appointed 'half-time' Venereologist to the Cape Divisional Council and played a major part in the highly successful campaign to bring the venereal diseases under control in the areas of greater Cape Town outside the City boundaries. Dogged by ill-health during the past three years, Dr. Osler continued to work and actually conducted his last clinic on 31 January—the day before his final admission to hospital. He leaves his widow, a daughter and two sons, to whom we extend our sincere sympathy.

Dr. F. K. Mitchell of Cape Town writes: As a young Medical Officer towards the end of the last war, I had the privilege of working under the late Dr. R. D. Osler, at Wynberg Military Hospital. There I learnt from him the true meaning of the word 'vocation'. When he was attending to a patient, he would devote his whole undivided attention to that patient, no matter how pressed for time he was. His manner was always friendly and sympathetic, his examination thorough—however uncooperative and apparently undeserving of sympathy the patient might be—and as V.D. officer his patients were not exactly the pick of the U.D.F. Never, during my months at Wynberg nor during the past seven years when he was part-time venereologist to the Cape Divisional Council's Health Department, did I know him raise his voice to a patient, to show irritability or impatience, or to appear to be in a hurry.



Robert Douglas Osler

late in 1946—doing a grand job and having a profound influence on the many young medical officers who had a spell at the Hospital.

I well remember one typical occasion when a dirty, slovenly Coloured mother brought into the clinic a filthy, miserable, half-starved, snuffly, congenital-syphilitic infant. Most of us would have given some expression to our disgust—but not 'The Professor', as our Coloured patients called him. He enthused to the mother over her beautiful baby, in no time at all had her believing it really was a beautiful little thing and worth a little maternal love and care—and in the incredibly short space of only a very few weeks he had the syphilis controlled, the dirt and malnutrition things of the past—and, unbelievably, it was a beautiful baby!

Dr. Osler was beloved by all his patients, whether white or Coloured, and by all his medical and nursing colleagues who had the privilege of working with him. He made no fortune out of medicine and had little to bequeath, but he has left us an ideal of service and self-sacrifice which he would have considered more important. Many of us will remember him, and the example he set us, with affection and humility for the rest of our lives.

Our world is a better place for his having been in it.

* * *

GORDON JAMES KEY, M.B., CH.B. (ABERD.)

Dr. J. A. van Heerden writes: Except for a few intimate friends and those professional colleagues who attended to him in his illness, the news of the passing of Gordon Key has come as a shock to the medical profession and the public in South Africa.



Gordon James Key

I have been associated with Gordon Key since 1925, and I got to know him more intimately during the past 16 years.

He graduated at Aberdeen in 1916 and shortly after enlisted, served in Salonika and was awarded the Mons Star for service with the Scottish Red Cross. He was recruited for the Union Mental service at Oxford and came out in 1920. After being posted to Bloemfontein and Grahamstown he was promoted Superintendent of the Mental Hospital at Pretoria in 1934. At his request he was transferred from Weskoppies to Valkenberg in 1937, since when until his retirement

in 1955, he was Superintendent and for many years head of the Department of Psychiatry at the Cape Town University.

Dr. Key took a keen interest in the training of Medical Students, and he was an enthusiastic and entertaining lecturer. He was an able administrator and he was considerate to his staff. In the very complex problems of a large hospital such as Valkenberg he always had a human and sympathetic approach in matters concerning staff and inmates.

There were few patients whom he did not know, and for whom he did not in passing have a smile or a kind word. He made many contacts in the sphere of social service and was easily accessible for advice and guidance. He took particular interest in the wider field of preventive psychiatry, and at the time of his passing was President of the National Council for Mental Hygiene.

Gordon Key was regarded as an authority on Forensic Psychiatry. His advice was sought by Bench and Bar, and not infrequently he was complimented by the Judiciary for his guidance in criminal trials. After his retirement he practised as a psychiatrist for 2 years. During this period he frequently assisted the courts and gave evidence in difficult criminal actions. He was an important adviser in 1944 when the Mental Disorders Act was

revised, and several provisions in the existing act were suggested by him.

His club mates will remember him as a fine sportsman, a breezy and pleasant companion with a fund of stories.

Dr. Key got his call early in December 1956 in no uncertain terms. In spite of the immediate prospect of a severe operation, and its implications, he displayed indomitable courage to the end.

To Mrs. Key and to his son and daughter, Dr. James Key of Bloemfontein and Dr. Ailie Key of Pinelands we extend our sympathy in their bereavement.

* * *

CHARLES WILLIAM COMRIE-SHARP, F.R.C.S.

The Rev. H. Herringshaw writes: It is true, I think, to say that most of Scotland's sons who have made a name for themselves have come, not from the cities, but from the country places. From many a quiet village, or lonely glen, a lad, trained by an



Charles William Comrie-Sharp

obscure, yet amazingly learned dominie, has gone forth to university, and thence into the great world to shine in the particular branch of science in which he has specialized.

C. W. Comrie-Sharp was born in the year 1879, in the little village of Comrie, in Perthshire, a village surrounded by great natural beauty. At the village school, the schoolmaster soon recognized in him a 'lad o' pairts', and encouraged the boy to pursue his studies further. Leaving the village school, he went to Morrison's Academy, Crieff, and from there to Glasgow University to study medicine.

While he was still a student, the Anglo-Boer War broke out, and he came out to South Africa as a dresser in the Scottish Red Cross Hospital. He liked South Africa and so, after graduating with honours in 1901, he came back to this country, becoming a general practitioner in Jacobsdal, where he met the lady who was to be his life's partner for fifty-four years.

When the First World War broke out, he went to England at his own expense and joined the R.A.M.C., serving on the Somme, where he was gassed. This left a weakness in his chest that was with him for the remainder of his life.

In 1919 he returned to South Africa to specialize in Gynaecology and Obstetrics. When the Second World War broke out, he again joined up, thus serving in the field of medicine and surgery in three wars. He retired after the war with the rank of Lieutenant Colonel, being mentioned in despatches.

Like a good Scot, he was always a keen golfer, and in later years he took up bowls with the same enthusiasm.

'Sharpey' was very popular, and had a large circle of friends. Whether life was easy or difficult he faced it with courage and cheerfulness at all times. In a quiet and unostentatious way many were helped by his generous hand, and more than one promising lad was helped by him to go through university.

He died in Groote Schuur Hospital on Friday, 22 March. To Mrs. Comrie-Sharp we extend our heartfelt sympathy.

OBITUARY

JOHN OLOFF MARAIS, M.B., CH.B. (EDIN.)

We regret to announce the death, due to a motor accident in Stellenbosch on 5 April 1957, of Dr. John Oloff Marais,

M.B., Ch.B. (Edin.), who recently retired after practising in Middelburg, Cape.

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ASSOCIATION NEWS : VERENIGINGSNUUS

ANNUAL MEETING OF THE CAPE EASTERN BRANCH

The Annual General Meeting of the Cape Eastern Branch was held at 8 p.m. at the Grand Hotel, Grahamstown, and was preceded by a dinner at which the retiring President, Dr. R. B. Wylde toasted the health of the incoming President, Dr. D. Girdwood of Bedford.

Dr. Girdwood's subject for his Presidential Address was 'Side Room Work in General Practice'.

The Office Bearers for 1957 were declared as follows: President, Dr. D. Girdwood, Bedford; President-Elect for 1958, Dr. B. Wolpowitz, Grahamstown; Hon. Secretary/Treasurer, Dr. Britten; Council: Drs. Heathcote, Solomon, Wylde, Gilbert, A. H. Vosloo, W. J. Vosloo, Dreyer, Mathieson, Wessels and Lalor.

The Annual Report and Balance Sheet were adopted.

The annual report stated: 1956 has seen a marked increase of interest in the Branch. Since our Annual Meeting on 17 March, five meetings have been held at all of which the attendance has been most gratifying.

A Clinical Meeting was held at the Fort England Hospital in April, where Dr. Wolpowitz, Physician Superintendent, demon-

strated the different types of shock treatment now being given at the Hospital and showed a most interesting series, all in one family, of Friedreich's Ataxia. These cases were later published in the *Journal*.

In June a General Meeting was held at the Settlers Hospital to discuss the proposed clause in the new Medical, Dental and Pharmacy Act, which would prevent most Doctors from dispensing. In September a Clinical Meeting was held at the Settlers Hospital. Dr. Wolpowitz gave case histories of a number of Cerebral Syphilis cases treated with penicillin. Dr. Perkins showed a case of Myelogenous Leukaemia.

In October Dr. W. Leith of Port Elizabeth, addressed a General Meeting on treatment in Ear, Nose and Throat Diseases.

In December a Business Meeting discussed alterations in Association bye laws. The purchase of a projector was again brought forward and it was decided the time had now come when this should be done.

The membership of the Branch is now 57.

NEW PREPARATIONS AND APPLIANCES : NUWE PREPARATE EN TOESTELLE

The Schering Corporation submit the following details of *Trilafon Tablets* and supply the following information:

Trilafon is perphenazine, an extremely potent tranquillizing and antiemetic agent. It is indicated in the management of a wide range of mental and emotional disturbances such as anxiety due to both functional and organic disorders, tension, agitation, agitated depression, panic, confusion, restlessness, psychomotor excitement and in post-alcoholic states. It is highly effective in controlling nausea and vomiting due to various causes such as pregnancy, migraine and tension headaches, gastro-enteritis, cancer, meningeal, psychogenic factors, drug and radiation therapy.

Action. *Trilafon* exhibits specific tranquillizing action in a wide variety of mental and emotional disorders with minimal side effects. Anxiety, tension, apprehension, aggression, psychomotor hyperactivity and fear tend to disappear rapidly with no dulling of mental activity. Patients become relaxed and quiet with an increased interest in their work and surroundings. Chronic fatigue and despondency based on nervous tension or anxiety are rapidly improved. *Trilafon* increases the patient's capacity to respond to psychotherapy and other therapeutic measures and is therefore of value as adjunct therapy in the treatment of many mental and emotional disturbances encountered in every-day practice.

Advantages. *Trilafon* exhibits extraordinary tranquillizing and behavioural effects without concomitant increases in autonomic, haematologic or hepatic side effects. Definite tranquillizing effect has been observed in many patients receiving a total daily dose as low as 16 mg. or less. Side effects such as jaundice, bone

marrow depression and narrowing of visual fields associated with other tranquillizing drugs have been notably absent in repeated studies with *Trilafon*. Others, such as blurred vision, nasal congestion and constipation, have been observed only occasionally. Hypnotic effects appear to be minimal, particularly in patients who are permitted to remain active. In studies to date, skin rashes due to the administration of *Trilafon* have not been seen. Other side effects such as nausea or vomiting, urinary frequency and polyphagia appear to be uncommon.

Dosage. Dosage must be adjusted for each individual case. In most patients 4 mg. three or four times daily is effective. The total daily dose ordinarily should not exceed 24 mg. in ambulatory outpatients. Higher levels may be required temporarily in resistant or severely disturbed hospitalized patients. In children over 12 the lower range of the adult dose should be used. Dosage for children under 12 has not been established.

Precautions. Patients receiving *Trilafon* should be chosen discriminately and should be kept under regular observation. Patients should be examined regularly for any signs of significant blood changes or other evidence of toxicity. *Trilafon* is contraindicated in comatose or severe depressed conditions, resulting from central nervous system depressants. The anti-emetic action of *Trilafon* may obscure signs of toxicity due to the overdosage of drugs or the diagnosis of conditions such as brain tumour or intestinal obstruction.

Packings. *Trilafon Tablets*, 2, 4 and 8 mg. bottles of 20 and 100; 16 mg. bottle of 50 *Trilafon Tablets* are manufactured in the Union of South Africa for and under the technical supervision of Schering Corporation by Schering (Pty.) Limited, Johannesburg.

PASSING EVENTS : IN DIE VERBYGAAN

At the 9th Annual Meeting of the Southern Chapter (S. Africa) of the American College of Chest Physicians held at the home of Dr. D. P. Marais, Regent of the College for South Africa, the following office bearers were elected for 1957: Chairman, Dr. D. P. Marais, Vice-Chairman, Dr. T. Schrire, Hon. Secretary, Dr. H. Muller, and Hon. Treasurer, Dr. M. J. Bailey. After the election, the 87th clinical meeting took place and interesting cases were presented for discussion.

* * *

Dr. W. H. Muller, M.B., Ch.B. (Cape Town), M.O. & G. (Cape Town), formerly of the Department of Obstetrics and Gynaecology,

University of Cape Town and Groote Schuur Hospital, has commenced practice as an Obstetrician and Gynaecologist at 4 Strathmore House, Boom Street, Klerksdorp. Telephone: Consulting rooms 1120, residence 1720.

Dr. W. H. Muller, M.B., Ch.B. (Kaapstad), M.O. & G. (Kaapstad), voorheen van die Departement van Obstetrie en Ginekologie, Universiteit Kaapstad en Groote Schuur-Hospitaal, praktiseer nou as 'n Obstetriker en Ginekoloog te Strathmoregebou 4, Boomstraat, Klerksdorp. Telefoon: Spreekkamers 1120, woning 1720.

REVIEWS OF BOOKS : BOEKRESENSIES

CHILD OPHTHALMOLOGY

Children's Eye Problems. By Emanuel Krinsky, M.D. Pp. ix + 175. 35 Figures. 86-00. New York and London: Grune & Stratton, Inc. 1956.

Contents: Preface. 1. Introduction. 2. Examining the Child. 3. Eye Disorders Mainly of Local Origin. 4. Other Eye Disorders. 5. Eye Disorders of Systemic Origin. 6. Problems in Management. Index.

This booklet briefly discusses the management of the common, everyday eye conditions that the young are liable to, by emphasizing environmental, psychological, hereditary and systemic influences. Therein the author's own opinions are stressed and the controversial aspects are omitted. It should therefore be useful to the student and the general practitioner, as it gives him a clear survey of the scope of ophthalmology, simply and without ambiguity. Because of this very brevity the book will not be of very great use to the specialist. The best section is that on psychosomatic problems. Many cases presenting with tremors and twitches, reading dis-

abilities or poor sight can be traced to factors such as parental mismanagement, unhappiness at home, fear of a teacher and so forth. The tactful and sympathetic approach will enable mental contact to be established between the patient and his examiner, and with patience and psychological handling the difficulty can be solved. It is also important to know what to tell the parents about such questions as surgery for a squint, the necessity of wearing glasses and the value of exercises. These questions are well covered, and several of what John Foster called 'ophthalmic myths' are exposed. The author rightly considers exercises for myopia, colour blindness and eye diseases as worthless. He also finds tuberculin in the therapy of suspected or proved tuberculosis of the eye of no practical use. A debatable point is the author's opinion on the value of occlusion for an amblyopic eye—that in most cases no improvement in visual acuity is obtained. He does not approve of it, because proper occlusion is considered impracticable and may be dangerous in traffic, as well as producing psychological upset. L.S.

CORRESPONDENCE : BRIEWERUBRIEK

MEDICAL INSURANCE

To the Editor: In order to allay the apprehension caused amongst members of the Medical Association of South Africa, many of whom are insured with us, we should like to make it clear that the policy referred to in the correspondence which appeared in recent issues of the *Medical Journal*^{1,2} is not an 'Atlas' policy.

The limits of indemnity for civil cases under our policies apply to damages only and these limits are selected by the insured who has the choice of the amount of cover he requires.

Normally all legal costs are payable over and above the limits of indemnity and there is no restriction on the amount payable in the way of such costs.

This has been the position since the approval of our policy by the Medical Association of South Africa in 1926.

T. G. S. Unite
Manager for Southern Africa
Atlas Assurance Co. Ltd.
52 St. George's Street
Cape Town
3 April 1957

1. Theron, R., (1957): S. Afr. Med. J. 31, 184.
2. *Ibid.*, 31, 267.

PAPER TESTS FOR GLYCOSURIA

To the Editor: In your editorial article of 16 February 1957¹ entitled 'Paper Tests for Glycosuria' the shortcomings of 'Tes-Tape' were discussed and, in particular, it was pointed out that 'It will be of little value in medical or other wards where diabetics are being controlled, nor will it be of sufficient accuracy for home use by the diabetics themselves'. Since reference is also made to copper-sulphate reduction techniques (e.g. Fehling's and Benedict's tests), and 'the very many annoying doubtful "green" tests found with the Benedict method' one might have got the impression that the control of diabetes was fraught with danger and that no suitable copper-sulphate method existed which would tell the diabetic all he needed to know.

In 1953 an article² describing 'Clinitest' Reagent Tablets appeared in the *British Medical Journal* stating 'the simplification and convenience of the tablet technique make it the method of choice in almost all circumstances, certainly in the control of treatment of known diabetics, either in the clinic or by the patient in his home'. The authors also agreed that 'in the control of treatment of diabetes, failure to detect an occasional trace or to determine the exact percentage of glucose is of little significance'.

The manufacturers of 'Clinitest' provide an excellent standardized colour-scale ranging from 1% to 2% sugar in urine with clear-cut distinctions in the clinically significant range, thus showing the approximate degree of glycosuria present. The standardization of 'Clinitest' tablets, droppers and colour-scales

permits the clinician to maintain a better control of his diabetic patients since he can rely on them to carry out the 'Clinitest' procedure in the same way at each testing. The author who wrote 'the Clinitest tablet has saved many lives'³ fully appreciated how difficult it is to boil urine in a patient's home.

It is hoped that this information has been of some comfort to those responsible for testing the urines of diabetic patients and that they will find 'Clinitest' eminently suitable for filling the quantitative gaps not covered by the new enzyme paper tests.

P. Medalie

1 Oliphants Road
Emmerentia Extension
Johannesburg
28 March 1957

1. Editorial (1957): S. Afr. Med. J., 31, 141.
2. Gray, C. H. and Millar, H. R. (1953): Brit. Med. J., 1, 1361.
3. Tudor Hart, J., (1956): Med. World (July).

'MENEER' OF 'DOKTER'

Aan die Redakteur: Dit spyt my dat professor van Eck Kirsten¹ so ontsteld was oor die dokter- of meneer-kwessie, te meer so daar hy in die gelukkige posisie verkeer dat hy nie die gevaar loop om as nog een nog die ander aangespreek te word na sy terugkeer tot die vaderland nie.

Dit spyt my nog meer dat deur sy verblyf in die buiteland, my kollega die Afrikaanse 'language' blykbaar nie meer verstaan nie want as hy my oorspronklike brief gelees en verstaan het, sou hy gesien het dat ek nérens daarin 'n pleidooi gelewer het vir die gebruik van 'meneer' wanneer chirurgie aangespreek word nie; ek het slegs gesê dat dit nog 'n vry land is en as iemand my as 'meneer' wil aanspreek, kan ek hom nie verhoed om dit te doen nie.

Miskien sal die professor en u ander korrespondente, wie my oor hierdie nietige saak aangeval het, beter slaap as hulle weet dat, ten spyte van my brief, ek sowel in die telefoonboek as op my bordjie as 'dokter' bekend staan.

Ten laaste, meneer Redakteur, moet ek om verskoning vra dat u kosbare spasie opgeneem word met sulke haarklowery oor die gebruik van 'n woord en belowe ek u dat, wat my betref, die korrespondensie nou gesluit is. Graag egter sien ek uit na 'n verdere mededeling van professor Kirsten, maar dié keer oor 'n wetenskaplike onderwerp wat spasie in u kolomme regverdig.

Willem Steenkamp

Groote Kerk-Gebou 812
Kaapstad
30 Maart 1957

1. van Eck Kirsten, J. H. (1957): S. Afr. T. Geneesk., 31, 296.

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